

GCE



CCEA GCE A2
Exemplifying Examination
Performance

Nutrition and Food Science

This is an exemplification of candidates' performance in GCE A2 examinations (Summer 2018) to support the teaching and learning of the Nutrition and Food Science specification.



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EXEMPLIFYING EXAMINATION PERFORMANCE

GCE Nutrition and Food Science

Introduction

These materials illustrate aspects of performance from the 2018 summer A2 examination series of CCEA's revised GCE Specification in 2016.

Students' grade A responses are reproduced verbatim and accompanied by commentaries written by senior examiners. The commentaries draw attention to the strengths of the students' responses and indicate, where appropriate, deficiencies and how improvements could be made.

It is intended that the materials should provide a benchmark of candidate performance and help teachers and students to raise standards.

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Best wishes

A handwritten signature in black ink, appearing to read 'D Wagner', written in a cursive style.

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GCE: A2 Nutrition and Food Science

**ANF11: Option A: Food Security and
Sustainability
Option B: Food Safety and Quality**

Grade: A Exemplar

Option A: Food Security and Sustainability

Section A

Q1a Describe how the Love Food Hate Waste campaign encourages consumers to reduce food waste. [10]

Student's response

The Love Food Hate Waste campaign is delivered by WRAP. Love Food Hate Waste try to raise awareness to consumers, households, communities etc revolving the issue of food waste and help individuals reduce their household food waste. One way that LFHW encourage consumers to reduce food waste is through their website. Their website provides advice, tips and hints with ways in which they can reduce their food waste. Such advice may include making good use of freezers, use leftovers, don't give into supermarket offers, which result in too much food being bought. LFHW provide information on the difference between best-before dates, use-by dates and sell-by dates. Therefore, if consumers understand that food can still be eaten after the best-before date, then food waste is likely to be reduced. Also, their website provides recipes which involve using leftover foods, which are very valuable to individuals who like the knowledge/skill of cooking with leftovers. Also, LFHW have a free app, which consumers can access on the go, with other ways of reducing food waste. They also have a free monthly newsletter. By LFHW increasing awareness around the issue of food waste, individuals now understand the issue associated with it. If consumers understand that £700 on average is wasted each year by families due to food waste then they're likely to take action. Also, LFHW help individuals understand that food waste can increase the greenhouse effect and in return climate change. LFHW also have many leaflets such as such as 'Apple eaters Hate Waste', which provide even more information about the consequences on food waste and how people can tackle the issue of 1/3 of food being wasted. LFHW educate consumers, helping them put measures in place to reduce waste. LFHW believe that education is the key to reduce food waste.

Examiner's comments

Full marks were awarded for this response as it demonstrated a highly competent knowledge of the Love Food Hate Waste campaign. The candidate applied their knowledge to the question with a clear focus on how consumers are encouraged to reduce food waste rather than just a description of the campaign. The examples provided enhanced the answer and showed a wider understanding of the campaign beyond practical tips for consumers.

10 marks awarded

Q1b Suggest possible reasons for the problem of food waste. [15]

Student's response

Food waste is food that is discarded which could have been eaten. Roughly $\frac{1}{3}$ of food produced is wasted, so I think that understanding the underlying reasons behind the problem of food waste will help tackle this issue.

Firstly, households contribute largely to food waste and infact households with children, waste £700 of food each year. This is due to overpurchasing food and buying extra due to the fear of having a food shortage. Consumers often give in to supermark offers such as 'BOGOF' which they find hard to resist. This often results in good food going to waste due to it passing its use by date as the quantity bought was too large. Also, unfortunately, many consumers aren't aware of the difference between 'best-before' dates (food can be eaten after, however, quality is decreased) and use-by dates (food must be consumed by this date due to safety reasons). They mistake best-before dates for use by and discard perfectly edible food. Many consumers are cooking too much which many thow away food not eaten, instead of making another meal out of leftovers. The lack of planning meals, eating out on a whim and incorrect storage also create food waste. Consumers may not know that root vegetables should be stored in a dark, dry cupboard and therefore it going out of date quickly. Also, many consumers aren't composting their food waste, which is a lot better for the environment.

Producers of food also contribute to food waste. They may produce too much food as a safety net due to the fear of vegetables/fruit being rejected by retailers if it is of irregular shape. Perfectly edible foods are often discarded by producers due to this issue. Producers may experience pests and diseases of crops, which will also create food waste as these crops aren't safe to eat. Weather conditions such as floods may destroy crops, meaning producers have to discard the ruined crops.

Manufacturers create food waste during cutting and peeling stages and may discard pieces of carrot, for example, which don't meet the specific size standard. Also, many manufacturers don't have a composting system in place for trimings and peelings and instead it's dumped at landfill sites. Manufactures are increasingly increasing the problem of food waste, especially in recent years, due to an increase in processed foods being made, and therefore more manufactures. Many produce too much food and may not have the forecasted orders, therefore the extra food is wasted.

I believe that retailers have a big role in the problems of food waste. This is due to them constantly wanting perfectly stocked shelves containing 'perfectly shaped' fruit and vegetables. They often reject fruit and vegetables, resulting in waste. If retailers purchase too much stock then they often have promotions, such as BOGOF. However, this only passes the issue onto the consumer and food waste is still the result.

Examiner's comments

This is an example of a response which fully satisfies the level description for the competent mark band. The candidate has successfully identified a wide range of reasons for the problem of food waste across the food chain. The paragraph on consumer contribution to food waste is well organised and coherent. The remaining paragraphs make appropriate rather than extensive use of specialist vocabulary and demonstrate a good rather than high degree of clarity.

11 marks awarded

Section B

Q2 Discuss the social and environmental disadvantages associated with large supermarkets. [20]

Student's response

Environmental disadvantages of supermarkets can concern the buildings themselves. Often old buildings will be designed to be less energy efficient for example they will not have windows for natural lighting and freezers will often be uncovered. This will mean an increase in the amount of fossil fuels burnt to produce enough energy to keep supermarkets running. Buildings on average in the UK cover about 40,000 square feet which has caused the considerable destruction of land and natural agricultural land. Land that could have been allowed to help reduce carbon affects of cities, but however have been turned into commercial land. Supermarket car parks alone will also cover 25 miles of square area which has caused the destruction of land. Further, environmental disadvantages can involve the destruction of natural land which can mean a reduction in biodiversity and the loss of natural habitats. These are often referred to as Greenbelts, which were designed to obtain natural land and prevent harmful effects on the environment on urban sprawl. Laws have been made to prevent destruction of these areas but supermarkets are able to convince planners to put money over environmental affects. In addition, supermarkets will also encourage added infrastructure to surrounding areas, this has been done through the building of roads to allow easy access by consumers. As supermarkets are often built on the outskirts of town it will have an environmental impact to the removal of natural agricultural land which will mean an overall increase in green house gas emissions as a net result. Supermarkets are said to be the number one contributor to climate change through increased carbon emission. Green land that once existed before could help capture carbon and reduce affects of global warming however supermarket buildings has promoted adverse environmental impact. A real live example of this can be seen at Hethrow Airport where a £100 million investment took place to build a road for food transport which has caused destruction of nature and therefore negative environmental impacts. Another negative environmental impact of supermarket are the increased reliance of road freight. Foods have been imported from all over the world as consumers now demand seasonal produce all year round. From 'the big 4' it has been estimated that they travel in total ov 600 million miles a year to transport food all over the world. Evidently this will lead to increase fuel burning and carbon outputs to impact climate change and parts of the world through the melting of ice polar caps. Supermarkets will expect monocultures and uniformity from primary producers, they will encourage the over use of pesticides and unsustainable farming practices. Incorrect use of pesticides, will encourage the over-reliance and the possible emergence of new pesticides to destroy crops. This will have environmental impacts as land will be wasted processing food that will go to landfill. They also make use of monocultures that will only give a small variety of output and will promote a more suppressed biodiversity. Supermarkets hold very harsh cosmetic standards and this can affect

environmental impacts through the wastage of good food. Instead of existing as intensive agricultural land, this land could have been saved to decrease carbon levels in the atmosphere.

Supermarkets will also cause significant social disadvantages. These can include the promotion of unhealthy foods that have been highly processed. A survey taken investigated supermarket promotions and it was discovered that out of 77,000 promotions that 53% of them were on unhealthy food products. Supermarkets will make highly processed food be more appealing to consumers through advertisements. As these foods are highly processed they will not have been sourced locally and will promote the decline of small farmers or independent local produce shops. This can overall promote a lack of farmer and consumer cohesion while also allowing a disconnect to consumers with their food. It allows them to consider other factors like price rather than social impacts. Another social impact that supermarkets can cause is the decline of the high street. As supermarkets are often on the outskirts of town this will encourage consumers to leave local towns and shops where they may have had to look around for what they were looking for. Consumers will deem supermarket more handy as everything is in one place. This will give less support to local farm shops meaning the loss of local jobs and the decrease in small farmers. By not promoting the buying of local food money will be taken out of the community and spend in profit demanding supermarkets. For every £1 spent in the local community this will mean 63 p remaining in the local areas for improvement in town and villages. In addition, another social cost will be the ruination of small farms. They will not be able to compete with supermarket prices and will leave business and ultimately their livelihoods. Social costs have also meant supermarkets will try to 'green wash' promotions to make consumer believe they are making good choices at the supermarket. For example carrots that are said to be 'local' will have travelled 200 miles from Wales to be sold in a supermarket. Or 'British' lamb shanks from New Zealand.

Examiner's comments

This response was awarded full marks because of the quality of discussion. It is clear, focused and detailed. The knowledge is accurate but it is the candidate's ability to apply it to the question that makes it a highly competent answer. The material is relevant and the writing style is appropriate. Presentation is of the highest standard and the meaning is absolutely clear to the reader.

20 marks awarded

Q3 Examine the benefits of Fairtrade for producers and outline some of the barriers that prevent consumers from choosing Fairtrade when shopping for food. [20]

Student's response

Fairtrade is a global organisation that over 360 countries are involved with. Fairtrade is about Food Security meaning that people have the economic and physical means of obtaining food that is nutritiously adequate and meets their personal preferences. It is also about Food sustainability which is development that meets the needs of the present with compromising the needs of future generations.

Fairtrade encourage producers to make environmentally sustainable food choice. they provide advice and expertize surrounding organic farming, they help to introduce new technologies as well as making use of traditional methods. This means that producers can make the most of their land and produce food which is both better for the environment and better for the farmers and their families. Fairtrade helps to reduce greenhouse gas emissions by showing farmers alternative methods, this includes training for workers to better their skills and ways to farm which don't cause land degradation. They also come up with new ways of dealing with problems such as drought and natural disasters and help them to get back on their feet again.

Fairtrade is about fair prices. Global food corperations take advantage of poor farmers and when the prices go up they keep the profits for themselves as oppose to distributing the profit equally. With the Fair Trade Standards minimum price it means that farmers and workers cannot be paid an unfair wage. With increased awareness and knowledge of farming they are able to demand more for what they produce and negociate with manufacturers. The fairtrade loan enables farmers to purchase more land to get their product more well known and on the market enabling them to make more money. Fairtrade standards are strict on working condition and prohibit the use of child labour, without the use of harmful pesticides workers are not at risk to disease or mortality and have the confidence to stand up for themselves if they feel they are being treated unfairly.

Fairtrade communities operate in cooperatives meaning that they are not on their own, they are in constant discussion and conversation with other local farmers. Fairtrade helps producers to build stronger co-operatives so that farmers can help one another. These cooperatives are entitled to a fairtrade premium which they can invest in whatever they deem best for example, better education, hospitals, land or sanitation, which will help to better the sustainability of the community as children get better education they can get better jobs which benefit the co-operative having a multiplying effect.

Fairtrade empowers farmers and workers giving them a voice in the supply chain and a sense of control over their lives and businesses. Fairtrade help make people more aware of their human rights and strive toward deepening gender equality. With more money, a better quality of life, improved education and medicine helps to produce a world that is food secure and sustainable. It gives children born into these communities opportunities at a better start in life and prevents the likelihood of poverty.

Common fairtrade produce includes bananas, coffee and chocolate. All of which can be found at most supermarkets however, a lot of people are reluctant to buy fairtrade produce and it must be questioned as to why not. Consumers may be unaware of the difference it can make, 47% of consumers said that they did not feel that the products they bought had any impact on people outside of the UK.

A lot of consumers are aware are aware of fairtrade however and are not ignorant of what it does but perhaps they are of low socio-economic status and cannot afford to purchase Fairtrade products as they generally are more expensive. Additionally, some people may not know what is fairtrade and what is not and this is why Fairtrade have a universal label, to be observed clearly on produce so that consumers can make food secure and sustainable food choices.

Examiner's comments

The command word for the first part of this question was examine which means to 'investigate closely, consider carefully and provide a detailed account of the indicated topic.' The candidate demonstrated these skills to a highly competent level. Although, only an overview of the barriers that prevent consumers from choosing Fairtrade was expected in the second part of the question, this response was considered to be too brief to be awarded full marks.

18 marks awarded

Q4 Evaluate environmental or green claims as a source of information for consumers who wish to make sustainable food choices. [20]

Student's response

Having environmental claims on labelling increases choice for the consumers as it increases awareness of environmental problems and demonstrates how their purchase can improve the conditions eg by buying rainforest products they are helping producers improve their quality of life.

Logos distill all the benefits of a scheme into a recognisable logo which aims to reduce confusion which increases the chance of consumers purchasing ethical products as they understand the benefits linked to the logo eg fair Trade.

Claims make issues such as CO² levels real by linking them to products. This increases the awareness of consumers about issues such as CO² leading to climate change. By seeing carbon footprint label they know the product eg kingmill is reducing their CO² impact which benefits the environment and allows consumers to be aware of the benefits that buying these products make.

However, the main influences of purchase is price and quality. The perceived cost of buying ethical food is much higher eg than organic unsustainable food. This decreases the motivation of consumers to purchase more expensive products as income may be tight or on a budget. Those who do purchase these products are more financially well off.

Green claims which are stated on labels often relate to the packaging rather than the product. This is misleading and decreases the will of consumers to purchase these products as they feel they are being lied to. Also often claims relate to just one ingredient included in the product. This too reduces the belief that consumers are making an ethical choice which decreases choice of ethical products.

Environmental schemes also cause confusion due to making similar claims regarding benefits. Both a red tractor and Northern Ireland Beef lamb and sheep, state they have brilliant animal welfare. This results in consumers having to chose the 'best' scheme which is challenging and decreases desire to purchase ethical products.

Labels do not state the benefits of the products which also leads to confusion. This decreases purchase due to limited knowledge with regards to benefits. The Black foot label related to carbon footprint does not state that the value is good or bad resulting in confusion over how good the purchase is; which decreases likelihood of purchase. Labels also contain facts for the consumer to interpret which results in added confusion due to lack of knowledge which decreases the will to make ethical food choices.

The evidence base for claims are often less widespread which decreases likelihood of purchase as there is reduced trust due to the evidence base being narrow. Consumers have the fear of purchasing products which are what they are declared to be so being uncertain about evidence decreases the likelihood of purchasing the product.

The overall knowledge of the 9 schemes are poor. Due to lack of knowledge it decreases the purchase of ethical products as they do not understand the benefits of the purchase. Only 83% of people aware of the logo of Fairtrade and 3% aware of logo for LEAF. This does not mean they are aware of the benefits. LEAF has more benefits than Fair Trade but is less widely known.

The purchase of ethical food is linked to motivation. If the consumer is not motivated to change behaviour then they will not purchase more ethical products. Lack of motivation is due to a lack of education surrounding the benefits a product can provide. If consumers are not concerned about the environment they will not buy conservation grade products which promote biodiversity.

To make claims more beneficial to consumers, producers are working with the government to produce labels which follow guidelines to reduce confusion and increase likelihood of purchase from consumers.

Those who make choices based on claims are often younger people due to the increased awareness of environmental issues due to links with social media. This increases the likelihood of media. This increases the likelihood of those consumers purchasing food which contributes to reducing environmental problems such as carbon footprint products.

Examiner's comments

The candidate demonstrated a competent ability to evaluate environmental claims as a source of information for consumers. The level of knowledge and understanding demonstrated was also deemed to be competent. The points made are accurate but not always clear to follow so quality of communication was considered to be competent rather than highly competent.

14 marks awarded

Q5 “Every day too many men and women across the globe struggle to feed their children a nutritious meal. In a world where we produce enough food to feed everyone, 815 million people – one in nine – still go to bed on an empty stomach each night. Even more – one in three – suffer some sort of malnutrition.”

Source: www1.wfp.org/zero-hunger

Consider possible reasons for the food poverty highlighted in the statement above. [20]

Student's response

Food poverty is the constant reduced access to safe, nutritious foods.

There are multiple contributing factors to food poverty. War and Civil conflict contribute to poverty as farmers are forced to flee land due to fields being mined making them infertile and unsafe and by contaminating water which reduces availability of water for irrigation 1110 of water is used for agriculture. Soldiers also used food as a weapon and starve opponents into submission which leads to food poverty due to lack of access to food. War also reduces the likelihood of aid reaching those in need due to reducing access to towns via road blocks, this results in food poverty as people don't have access to nutritious food.

Climate change is also contributing to food poverty due to exacerbating already adverse conditions. Drought is the main contributor to food poverty as it makes arable soil infertile and not ideal for growing crops due to lack of water. Developing countries also do not have access to irrigation system to improve crop yield/or growth. In 2011 there was massive crop and livestock losses in Ethiopia resulting in 226 million starving and a famine was declared. Also due to temperature increasing it increases the likelihood of pest action which decreases crop yield and availability of food due to pests being the principle pest of food and decreasing crop yields. Also make crops less nutritious so don't meet the needs of people which result in poverty as food is not meeting needs.

Unstable food markets make food temporarily out of reach for income poor people. This has lasting effects on children due to less nutritional nourishment due to no access of food which causes food poverty. This increases the risk of micronutrient deficiencies and stunting in developing children. Rising food prices results in poverty as people have no economic access to food.

Complex situations also result in food poverty. In Somalia the effects of a drought was worsened by the lack of functioning government and civil conflict. This resulted in food poverty as drought improvement strategies could not be put in place which resulted in people having less access to food due to no crops being able to be grown due to lack of water and good soil quality.

Disease also plunges communities into food poverty. HIV/Aids caused the death of farmers which removed skill and knowledge to grow crops. This resulted in poverty due to less crops being grown due to the destruction of knowledge, this decreased direct access of food as crop yields were reduced, this cause poverty as communities did not have crops available to them. The Ebola outbreak also cause poverty by decreasing access to food as deliveries would not make it to the infected area due to concerns about contamination. This resulted in poverty due to reduced availability of crops being grown via direct access and the reduced availability as of imported food which reduces overall supply.

The lack of infrastructure also contributed to food poverty. The deceased traffic roads decreased the imported produce due to poor roads and no access to town which resulted them being reliant on what they could grow. The lack of storage caused food spoilage in hot climates which cause food poverty as there is reduced availability of safe nutritious food. The lack of irrigation systems and access to clean water resulted in food poverty as it reduced the quality of crop yield and reduced growth of crops.

Food wastage also causes food poverty as it decreases the availability of resources to grow other crops. The wasted crops are the equivalent to 3.3BT of ghge and the domestic water needs of 9 Billion. The decreased resources results in lower crop yields and quality of crops are poorer which results in food poverty.

'Zero hunger' has been created to reduce hunger by 5 steps, 'maximise first 1000 days' for example to improve mental and physical health which increases the chance for communities to break the cycle of poverty.

Examiner's comments

This response was awarded full marks because it is a highly competent response in terms of focus and quality of written communication. The candidate has clearly reviewed and responded to the quote as expected by the command word. The level of knowledge and understanding is mature and worthy of a top mark.

20 marks awarded

Option B: Food Safety and Quality

Section A

Q1a Describe the work of the European Food Safety Authority (EFSA) in relation to food safety from field to fork. [10]

Student's response

Europeans enjoy one of the highest standards of food safety in the world. EFSA ensures safe and healthy food for consumer consumption, it does this by continual cooperation with the EU member states. EFSA uses scientific based advice to identify food safety risks along the entire food chain. Including plant health, animal welfare, transporting, storage and food preparation.

EFSA monitors and assess the use of chemical pesticides, as well as the effect of pests on the plant health. If the regulations are not followed, it may cause a potential risk on human and animal health.

EFSA evaluates the way in which animal and products of animal origin are transported, as well as the welfare of the animal. These actions are to ensure limited biological infection, as well as chemical contamination e.g. from veterinary medicines. It helps to reduce the risk of food – borne illnesses, as the main source of food borne illnesses are animals and products of animal origin.

EFSA assesses the risk posed on the eco-system, from genetically modified products, pesticides, additives in animal feed and nutrient source. This ensures that the substances entering the environment are monitored and therefore do not pose a risk to human health. EFSA evaluates the science behind health claims such as low fat. This ensures that consumers can make an informed choice, regarding the food they consume.

EFSA collect data on food consumption, and use the data to evaluate and assess the risk to human health. In relation to maximum residue levels of pesticides and other contaminants, which may be contained in food products.

Examiner's comments

The candidate displayed highly competent knowledge and understanding of the work of the European Food Safety Authority (EFSA) and was evidently aware that their main role is to assess and communicate risks associated with the food chain. The candidate provided a good range of examples of the EFSA's work in relation to food safety from field to fork, describing most in a highly competent manner. If the candidate had developed one of these areas a little more, full marks would have been awarded. For example, transport and storage and animal health and welfare could have been described separately to allow for more knowledge and understanding to be displayed. QWC is highly competent with good terminology.

9 marks awarded

Q1b Explain why food safety is a public health priority. [15]

Student's response

Food safety is a public health priority with the increasing size of the population. With increasing population, there is more complex food chains and therefore there is more areas which can affect food safety. With the complex food chains, there are more products being imported from third world countries. These pose a risk to public health as these countries do not have the same regulation in place as set in the EU. There also comes the issue of the increase of intensive farming, with the increase in demand of food. This affects food safety as intensive poses a greater risk to food safety, with the large amount of produce comes the issues of excessive use of pesticides on plants and vet. medicines in animals. Therefore it may increase the amount of residues on food, as well as a possible cause of increased antimicrobial and antibiotic resistance.

With the increasing population, also follows the increase of poverty. This puts food safety as a public health priority as approximately 2 million individuals die each year as a result of the 200 diseases caused by poor food safety. With poverty there is a lack of access to safe and healthy food and as a result leading to an increase in chronic diseases such as cardiovascular disease as well as increasing the risk of microbiological contamination. This may be due to the lack of regulation in third world countries and lack of knowledge regarding food safety in the EU.*

There has been an increase in the amount of single parent families and therefore there has been an increase in the amount of ready-to-eat meals being eaten. With these comes the risk of microbiological contamination and diarrheal diseases as well as increased risk of chronic diseases, due to hidden fats and sugars.

**Poor sanitation also has a part to play as contaminated water can cause many diseases from diarrhoea to meningitis.*

There has been an increase in globalisation and therefore more food is being consumed outside the home e.g. on street vendors. Therefore this leads to an increase in food safety worries, as the vendors may not follow food safety guidelines. With globalisation there is also more imports as well as exports. For example the UK exports 90% of its pork. This may also increase the risk of zoonosis, which can be spread from animals to humans.

Examiner's comments

This is a well structured and succinct explanation of why food safety is a public health priority. A good variety of issues have been identified and explained in a highly competent manner meriting the top mark band. The candidate did not simply list the reasons why food safety is a health priority but fully developed their response. For example, increasing population is expanded to explain how this can lead to intensive farming, complex food chains and more imports with different food regulations. Clear evidence of assessment objective 3. QWC is highly competent.

14 marks awarded

Section B

Q2 Describe the quality assurance systems food manufacturers should use to ensure safe food production. [20]

Student's response

Quality assurance systems have been put in place in order ensure food safety, reduce the risk of hazards occurring and increase the quality of food produced. The first system which is of top priority to be implemented and used by manufacturers is GMP, (Good Manufacturing Process). This is a system which is put in place to increase and for food manufacturers to meet the needs of quality, control and legal requirements based on processing food. It is a requirement for all manufacturers to implement this system in their food manufacturing business and should be implyd in all parts of the operation processes in the food business GMP describes, the method, facility, control and processes which need to be put in place in the manufacturing of processed food. As minimum sanitary and processing requirements for the production of safe and wholesome food this should be an important area of control for food manufacturers who produce processed food to implement. GMP has been in action for over 30 years and continues to be re-evaluated and revised. GMP describes the general conditions and processes to be undertaken in a facility of processed food production. GMP is important because it increases repeat orders from being placed by big company's in the retailing business such as Asda and Tesco. It also reduces the risk of complaint and from foods being reprocessed which are all areas in which GMP covers. GMP deals with issues such as hygiene, and complaints for example. They prevent consumers and individuals from purchasing food which can pose a risk to their health and cause fatal consequences. If manufacturers do not comply with GMP regulations and legislation this will lead to serious consequences including prosecution. GMP aims to produce foods of a very high standard of international standards. They also ensure that they have correct controls in place and evaluate any changes made during food production, as these changes can disrupt the quality of the finished product. There are basic rules which need to be adhered to. They include records which need to be kept, All rules and procedures must be written in clear language and all food operation and manufacturers must ensure that they are trained in keeping documentation manually or on a computer system. All processes of manufacture must be recorded so that it can be traced back at any time and point of the food chain from manufacturer and processing to distribution. Distribution of products must all be done carefully to reduce the risk of quality of products beind disrupted. Lastly, in addition to the rules mentioned above all complaints which are made in relation to a food product to the manufacture must be examined immediately and carefully. GMP also plays a role in the hygiene and manufacturing of equiment however this area of work is not covered by GMP legislation and should be made aware to the manufacturers of equipment where they should understand the hygiene rules in relation to equipment. Equipment should not have any ledges and dust traps

where dust can build up leading to the contamination of food and equipment should be able to be dismantled without the use and need for tools. GMP has a basic checklist which should be followed in order to ensure safe food production throughout the manufacturing processes. A sewage system should be put in place, hygiene of the outside premises should be maintained as well as inside the premises and facility. Hygiene facilities should be maintained and hand washing facilities should be provided. Preventing contamination of chemical substances, microbiological hazards and physical hazards should also be controlled. The maintenance of adequate lighting and ventilation should be upheld. This is to name a few of what manufacturers should follow to ensure safe food production and maintain hygiene standards.

Another system implemented by food manufacturers which should be adhered to is the quality assurance scheme which is a system in place to prevent and correct any failures and mistakes made during food production. This is helped by following a handbook of standard operating processes to ensure no hazard arise in the production of food and to ensure that food safety is maintained. Food manufacturers implement many food, quality assured systems which increase probability of safety of food. These systems also help to build businesses reputation. Examples of a quality assurance scheme is RSPCA. They are an animal welfare team which helps to improve the lives of animals by making sure that farmers adhere to animal welfare standards of the RSPCA. RSPCA aim to improve the lives of 10 million animals in the next 5 years and are in the top 10 of most recognise animal welfare charities in the UK. Good practice, and management should be put in place and this is not determined by indoor as compared to being outdoors. RSPCA welfare officers inspect farms annually and they can also turn up without warning or without notice not being authorised to inspect a farm. If farmers do not adhere to the RSPCA animal welfare standards this can result in farmers being suspended from the scheme or even being removed from the scheme which can impact their reputation and also income. Another example of a quality assurance scheme is the Lion eggs which is a stamp on eggs to show that they are British and that they are salmonella free. It also indicates to consumers the high quality of eggs produced where the hygiene standards would be fully complied with and that the egg can be full traced back with the traceability system implemented. All eggs which have a Lion mark have been declared salmonella free and indicates to individuals that birds have been injected against any diseases which therefore increases quality for consumers.

The traceability system is another quality assurance system in place which allows food to be traced back to its origin and the source where it came from. Traceability is used when a natural authority identifies a risk in a food impacting consumers health therefore allowing the hazard and food to be traced back from where it comes from so that food and any foods containing the product which has been contaminated can be removed from shelves and the market before it reaches consumers. The EU general food law has been enforced since 2002 and has required all food manufactures to implement the food traceability system in all food businesses. This is compulsory and must be adhered to without failure. A failure in adhering and

implementing the system can lead to serious consequences. This system must all include the RASFF system which is a Rapid Alert system for food and feed safety. It is a warning system which allows an alert to be sent out by the European Commission if a hazard has been found in foods. This lets consumers aware and informs them of a hazard or even if a substance has been undeclared in food know of the risk to health and in that it can be removed from the market: These are all systems which food manufacturers must implement to ensure safe food production at all times and to minimise the risk of contamination leading to food poisoning.

Examiner's comments

Quite a long and general discussion about why food manufacturers should employ Good Manufacturing Practices (GMP). The description of GMP loses focus at times but improves once the candidate describes the controls that should be in place for GMP, with a few inaccuracies in places. For quality assurance standards the candidate describes the rationale and provides examples such as RSPCA Assured and Lion Eggs to highlight how these ensure safe food production. Traceability was described concisely with highly competent knowledge and understanding. The candidate was aware of the legal framework involved with the EU's General Food Law 2002 making traceability compulsory for all food manufacturers. Overall the candidate displayed highly competent knowledge and understanding of the quality assurance systems manufacturers should use to ensure safe food production.

16 marks awarded

Q3 Discuss what is being done to minimise the risk to public health of the following chemical contaminants in food:

- dioxins
- mercury
- acrylamide
- arsenic in rice. [20]

Student's response

Over 90% of Dioxins exposure to human are from the diet from high fat food such as meat, fish, eggs etc. therefore protecting the food supply is critical when it comes to minimising the risk to public health. There are no maximum levels set for dioxins in food but the EFSA are in the process of setting acceptable levels. To protect the food supply, strict controls are in place to prevent contamination of animal feed with dioxins which would make its way into the food chain. The European food safety authority take samples of food and test for levels of contaminants such dioxins. Those foods that are above acceptable levels are subject to recall and risk management and follow up action will be taken. Advice has been given for the proper incineration of food contaminated with dioxin's in order to minimise the risk of spreading. The foods standards agency issued advice to consumers to trim the fat off their meat and consume low fat varieties of products to reduce exposure. A varied diet should be consumed to reduce exposure from a single source. Methyl mercury is the most toxic heavy metal and is of priority to minimise the risk to public health. In 2008 the EFSA's Lontam panel considered the risk of methyl mercury to animal feed. This would minimise risk to public health by preventing it earlier in the food chain. The food standards agency issued advice to pregnant women to avoid excessive consumption of marlin, shark and swordfish due to high levels of mercury that may be damaging to the foetus. Acrylamide is a compound produced when foods are cooked at high temperatures (over 120°) for long periods of time. Much has been done to minimise the risk to the public. The FSA has a campaign 'Go for Gold' in which consumers are encouraged to cook until golden rather than overcooking which increases acrylamide consumers are also encouraged to follow cooking instructions on the packaging for correct temperatures and cooking times. The public are told by the FSA not to keep potatoes in a fridge as this encourages cold sweetening which increases levels of acrylamide potatoes should be stored in a cool dark place above 6°C. Consumers are encouraged to eat a varied diet to reduce exposure to acrylamide from a single source. The food industry is also working to reduce acrylamide. Food Bank Europe has compiled a code of practice on how to reduce acrylamide in foods. The FSA are working to understand more acrylamide through supporting manufacturer initiatives to produce crops with less acrylamide. They produced a new UK total diet study and are conducting more research into acrylamide and are issuing surveys and publishing the data for an increased awareness. In arsenic organic is toxic and present in rice which contains 10–20 times more arsenic than other sources. In 2015, the EFSA set maximum limits for arsenic in foods to 0–2 ⇒mg /kg. The EFSA also conducted a survey on chemical

contaminants in infant food, particularly arsenic in rice products to review current levels. If there is any concern, the FSA will reconsider the maximum limits set. The FSA has issued advice on how consumers can reduce levels of arsenic in rice. These include: choosing different variations of rice such as Thai Jasmine which was a lower arsenic level. Another guidance was to opt for other grains such as cous cous as opposed to rice. The third suggestion was to soak rice overnight and cook in a 5:1 ratio of water:rice. These tips can help reduce arsenic levels by up to 80:1.

Examiner's comments

Highly competent knowledge and understanding of the chemical contaminants listed and highly competent ability to discuss what is being done to minimise the risk to public health from each of these contaminants. The candidate produced an organised and coherent response discussing in a focused manner what is being done to minimise risk to public health. There is no irrelevant information, such as the side effects of consuming high levels of the contaminants. A good range of measures have been discussed, for example, prevention and control, monitoring, role of manufacturers and advice to consumers. Acrylamide and arsenic in rice have been particularly well covered with a wide range of current measures accurately discussed.

17 marks awarded

- Q4** Explain how the risk of microbial contamination can be minimised in establishments that serve food and outline how food law inspections help ensure food safety in these establishments. [20]

Student's response

Establishments serving food should have a HACCP system (hazard analysis critical control point) in place to prevent any breaches of food safety arising. Food businesses should follow strict hygiene practices to minimise the risk of microbial contamination. Staff should be adequately trained and wash hands regularly, especially over handling raw or uncooked foods, such as meat, poultry and raw eggs. These foods may cross-contaminate other foods if not handled, prepared or stored correctly. Separate chopping boards should be used for raw and cooked foods to prevent cross-contamination. Raw meat should be kept in a sealable container at the bottom centre fridge so its juices do not drip onto cooked foods. Fruits and vegetables should be washed thoroughly before use, as they may have come into contact with manure used to help them grow which could be a source of salmonella, or even Escherichia Coli. Food establishments should ensure milk is pasteurised or boiled, and all eggs are cooked thoroughly. Meat should be cooked to a core temperature at 78°C, and poultry to 82°C. It should be piping hot in the middle, with steam coming off it. Foods should only be reheated once, and cooked to an even higher temperature (82°C) to kill bacteria. Food that is not eaten after reheating should be discarded. Chilled food should be kept in the fridge at a temperature of 0–5°C to prevent the multiplication of bacteria and the door should only be opened when necessary. Surfaces, worktops and utensils should be washed thoroughly with hot water and disinfectant to kill bacteria. Employees of the food establishment should be particularly careful with their personal hygiene, being careful to wash hands after using the toilet, not sneezing or coughing over food or in areas where food is being prepared, wearing blue plasters over any cuts or open wounds and informing their employer if they have symptoms of certain illness, such as diarrhoea, vomiting or fever. They should also wear hairnets and protective clothing or gloves when handling or serving food to avoid passing on bacteria. Areas where things could go wrong (hazards) should be identified and critical limits set up at each (such as time or temperature). These should be monitored to ensure these limits are being met. A corrective mechanism should be in place if something goes wrong – written, detailed documentation should be kept to document all procedures.

Food law inspections look at three key areas of food safety, and only a top rating of 5 is awarded to businesses that perform excellently in all three areas. They are: how hygienically food is handled, the condition of the structure of the building and how business manages what it does to ensure good safety. The Food Hygiene Rating Scheme recognises businesses that do well in these key areas, thus improving their custom, whilst incentivising those businesses that are more poorly performing, encouraging them to boost their standards. When businesses are given a rating, it is available on FSA's website and can be viewed by anyone, so that the public can choose to eat somewhere with higher good standards. More poorly*

performing business will get fewer customers if their rating is very poor. This will help to prevent food borne illness, and encourage the business to improve their standards so that they can start attracting more customers again.

Food law inspectors will usually come unannounced and so may catch businesses off guard if their standards are poor. Inspectors can take sample of food and photographs for evidence if there has been a complaint. This helps to catch problems in food safety early on to prevent a more widespread outbreak of food poisoning from a dirty eating place. Food law inspectors can seize suspect foods which may pose a danger to the health of customers.

Inspectors can also issue businesses with different types of notice, such as a 'Food Hygiene Emergency Prohibition Notice' which forbid a business from carrying out certain processes, or using some equipment, but must be confirmed by a court. The 'Remedial Action Prohibition Notice' is similar, but does not need confirmed by a court. Failure to comply with a notice once served is a criminal offence which can lead to a fine or even imprisonment. As a result, food businesses are encouraged to take action to improve their business hygiene standards and this then improves food safety and public health.

Food inspectors must tell the business owner which areas need improved upon, and standards must be improved to maintain a rating.

Food law inspections also help to direct resources to more poorly performing businesses that need it most, and these are the businesses that receive more frequent inspections. These more frequent checks help to keep on top of poorly performing businesses pushing them to improve their standards and their public health.

Examiner's comments

The candidate was clearly focused on explaining in a highly competent manner how risk of microbial contamination can be minimised in establishments that serve food rather than producing a list of basic food hygiene rules. Their knowledge and understanding was highly competent, for example, they noted the contaminants that may pose a risk to health such as E. coli on unwashed vegetables and the core temperatures for cooking meat. HACCP has been included and was essential for the top mark band. They accurately covered cleaning, cross contamination, temperature control and hygiene of staff. The candidate highly competently demonstrated how food law inspections ensure food safety. However this was much more than necessary considering the command word was 'outline'.

20 marks awarded

Q5 Examine the work of the Food Standards Agency (FSA) in relation to food allergy and intolerance. [20]

The above question could not be exemplified as the candidate's permission could not be obtained.

