

**2004 Health and Food Technology**

**Advanced Higher**

**Finalised Marking Instructions**

## **Instructions to markers.**

### **General Instructions**

Each question is marked out of 25. Markers should use the full range of marks available as indicated in the mark descriptors for an A, B and C response at the top of each question.

Candidates should be awarded according to the quality of thought revealed in their answers. They should not be rewarded solely, or even mainly, according to the quantity of knowledge conveyed. In progression from Higher a more advanced grasp of the skills of analysis, synthesis and interpretation is required. Credit will be awarded according to the degree of success with which the candidate:

- gives an answer which is relevant to the question and is explicitly related to the terms of the question
- is able to make the various distinctions required by the question
- responds to all the elements in the question in a coherent manner
- applies knowledge and explains, analyses, discusses rather than simply stating facts
- develops the skills of analysis and evaluation through critical appraisal.

## Section A

(a) Outline the main issues identified in the report.	<b>Mark allocation: 5 marks</b>
<b>A-4-5 marks</b> The candidate is able to outline four to five of the main issues of the report.	
<b>B-3 marks</b> The candidate is able to outline three of the main issues of the report.	
<b>C-2 marks</b> The candidate is able to outline two of the main issues of the report.	
<b>Answers should make reference to the following points:</b>	
<ul style="list-style-type: none"><li>• diet in childhood important in a number of areas – current and future well being, growth and development and educational achievement</li><li>• food choices in school could contribute significantly</li><li>• Scottish school children are deliberately making unhealthy choices at lunchtime despite knowing the consequences</li><li>• the reasons for this are linked to short dinner breaks, long queues, unpleasant surroundings and a lack of pricing incentives to eat healthily</li><li>• children tend to choose calorie dense rather than nutrient dense diets</li><li>• a small proportion of school children think about their health when choosing meals</li><li>• report from Children in Scotland recommends a whole school approach to tackling Scotland’s poor eating habits</li><li>• the agency agrees with the Scottish Executive report stating schools need to radically overhaul their image regarding school meals</li><li>• surroundings vital to improve image</li><li>• suggestions include provision of free water, nutritionally applied standards (non statutory) and removal of stigma for those receiving free school meals</li><li>• guidelines cover the nutrients and micro nutrients which are of most concern in children’s diets eg some vitamins and minerals (Candidates may give actual figures for nutrients)</li><li>• fruit and vegetable content also to be considered – around 30% being supplied by the school lunch</li><li>• a range of tactics should be used to encourage healthier choices and the removal of stigma attached to free school meals</li><li>• chief executive said whole experience needs to be more positive and families, schools, communities must all become involved in this education process</li><li>• Mike Lean is optimistic that things can change by offering healthy options of popular foods, changing parental attitudes and curricular provision may take longer</li><li>• poor choice of meals and vending machines contribute to the fact children are receiving food which is detrimental to their health</li><li>• Scottish Executive’s health improvement fund has started several initiatives which aim to make health education integral to the curriculum, school ethos and extra curricular activities</li><li>• Scotland’s food and health coordinator agrees that the executive’s initiatives are helping Scotland to improve its eating habits</li><li>• problem of conflicting messages – vending machines and tuck shops</li><li>• use of pricing incentives to help change choices, but any such incentives must impact on both pupils and parents if they are to be really effective</li><li>• school meal is important in many ways – nutrition and promotion of healthier eating but also in relation to life and social skills</li><li>• ultimate decisions up to pupils – to keep them in school and influence choice, they must be attracted with more interesting meals.</li></ul>	

(b) Discuss ways in which a “whole school approach” could be used to tackle children's poor eating habits.

**Mark allocation:** 10 marks

**A-8-10 marks**

The candidate is able to develop a full and coherent discussion how a "whole school approach" could be used to improve children's poor eating habits. The discussion shows good analysis and the identification of the majority of the main points with full explanation.

**B-6-7 marks**

The candidate is able to develop a discussion of how a "whole school approach" could be used to improve children's poor eating habits. Most of the main points will be identified with some explanation.

**C-4-5 marks**

The candidate will be able to identify some of the main points with limited explanation.

**Answers should make reference to the following points:**

- essential that messages taught in the classroom are backed by foods on offer in school otherwise messages become confusing
- eating well needs to be part of our lives – if children eat differently at school this could affect food choices out of school and the food choices of entire families
- breakfast clubs must back up messages taught in the classroom
- after school clubs must provide children with nutritious, filling snacks to reinforce messages
- the introduction of schemes to facilitate healthy choices
- caterers must back agreed healthy eating messages and not overtly promote unhealthy choices
- senior managers/dining hall supervisors/dinner ladies/men should be aware of healthy eating messages and encourage healthy choices
- incentive schemes could be used, eg pricing, competitions, to encourage healthy choices
- links between biology and nutrition could be used to promote the value of foods
- links between PE and foods could be linked via sports nutrition
- home economics departments have a vital role to play in providing pupils with the skills to prepare healthy, nutritious foods
- home economics departments can link with school meals supervisors to promote good choices at lunchtime by using the curriculum, competitions, food tasting etc
- involvement of parents vital to the improvement, they must be on board, educated and well informed
- school board/PTA could help organise educational activities/leaflets for parents regarding healthy choices
- community dieticians could be used to bridge the gap between home and school
- joint projects between health centres and schools could help reinforce messages
- reduction in the use of vending machines to raise funds or changing the contents of such machines to promote a more nutritious diet
- reduction in the use of sweets as prizes at school activities
- use of School Nutrition Action Groups to promote whole school health and nutrition
- have a clear whole school policy regarding nutrition at school
- development and education of all school staff to promote the healthy eating initiative
- involve pupils at all stages of policy development and implementation to ensure their views are heard
- positive relationships between head teacher and catering company vital
- pupils and staff must be allowed to comment on school meals in a meaningful and constructive way

- health weeks/health promoting events
- local authority involved in training food providers about healthy eating
- positive incentive to encourage pupils to stay in school to try and discourage those who eat out of school
- school trips organised with thought given to food eaten to ensure they meet schools nutrition policy
- use of local ‘celebrities’ to promote healthy eating
- use of marketing techniques to promote healthy eating.

(c) Critically discuss why the majority of pupils choose to ignore healthy eating advice and deliberately opt for nutritionally deficient foods.

**Mark allocation:** 10 marks

**A-8-10 marks**

The candidate is able to critically discuss the statement giving full analysis.

**B-6-7 marks**

The candidate is able to critically discuss the statement giving some analysis.

**C-4-5 marks**

The candidate is able to critically discuss the statement giving limited analysis.

**The candidate should make reference to the following points:**

**Peer pressure**

- peers – very conscious of being part of a gang so copy cat behaviour is very common, similarly being seen to be different ie making healthy choices may cause ridicule.

**Parents**

- their eating habits are passed on to their children and children learn to like foods made by parents. These may well be unhealthy
- financial situation of the family may mean that foods consumed at home are limited, these limited choices may be a cause for similar unhealthy choices at school
- children may be unwilling to try new healthy options if they have not seen and tried them at home.

**Media/promotion**

- advertisers target young people in their adverts for fatty, sugary products, this is a very powerful medium and hard for children to resist
- some foods are promoted as if they are healthy eg Sunny Delight, such promotion aimed at children is difficult for them to decode, so they may actually think they are making a healthy choice.

**School**

- children confused by conflicting messages in schools – home economics say eat x but other adults provide us with y – what do we do?
- meals provided are not always of a high quality so basic, often unhealthy choices are made
- healthy choices such as fruit are often unimaginative and poorly presented
- no one encourages children to make healthy choices at lunchtime, at this age, if wise decisions are to be made guidance is needed.

**Personal Factors**

- children like the familiar and may be unwilling to experiment with new foods, particularly if money is limited as they may not then be able to afford an alternative
- personal likes/dislikes – high fat foods such as chips, sausage rolls appeal to children's taste buds/provide a quick, satisfying fix/used as rewards
- habits form easily, children often choose the same thing every day and are unwilling to change
- many children prefer the taste of sweet snacks such as cakes and biscuits to fruit and so make that choice instead of choosing fruit which can be more awkward to eat
- many of the unhealthy snack foods are easy to eat and can be eaten on the go – this is an important factor if dining halls are busy
- local shops and cafes provide quick, cheap alternative lunches in surroundings which appeal to pupils but which provide unhealthy choices
- pupils may prefer to 'escape' from the school environment to eat elsewhere, choosing to eat unhealthy foods
- healthier options tend to be more expensive/perceived as less filling.

**Health**

- difficult for children to relate their health as an adult with what they eat as a child, the time scales are too great
- healthy choices in some schools overpriced.

**Availability**

- unhealthy options tend to be more readily available eg in vending machines, local shops.

## Section B

1(a) Discuss how the implementation of the Scottish dietary targets for 2005 could help achieve a reduction in the consumption of fats.

**Mark allocation:** 10 marks

### **A-8-10 marks**

Candidates are able to develop a full and coherent discussion of how the Scottish dietary targets for 2005 could help achieve a reduction in the consumption of fats. The discussion shows good analysis and the identification of the main points with full explanations.

### **B-6-7 marks**

The candidate is able to develop a discussion of how the Scottish dietary targets for 2005 could help achieve a reduction in the consumption of fats. Most of the main points will be covered with explanation.

### **C-4-5 marks**

The candidate will be able to identify some of the main points with limited explanations.

### **Answers should make reference to the following points:**

#### **Fruit and vegetables** – average intake to double to more than 400g per day

- a diet which is high in fruit and vegetables due to the filling NSP content could reduce the desire to consume foods / snacks which are higher in fat
- fruit and vegetables contain little or no fat so will assist the overall reduction in fat in the diet
- many ways of consuming fruit and vegetables do not involve any or very little quantities of fat in either preparation or cooking
- changing diet to consume more fruit and vegetables may in turn change ones palate and hopefully such changes may result in a reduction in the intake of fats and fatty foods.

#### **Bread** – intake to increase by 45% mainly using wholemeal and brown bread

- bread is rich in starchy carbohydrate and is very filling thus reducing the need to fill up on fatty foods.

#### **Fats** – average intake of total fat to reduce from 40% to no more than 35% of total energy intake

- following this target would reduce the consumption of fat to satisfactory levels
- choice of foods lower in fat eg skimmed milk/ chicken etc would help lower fat content of diet
- choice of cooking methods, in line with dietary targets, would help lower fat content of diet.

#### **Fats** – average intake of saturated fatty acids to reduce from 16.6% to no more than 11% of total energy intake

- if this target is met it is possible that alternative sources of energy would be sought, there is an opportunity for this extra energy to come from starchy carbohydrate foods
- more likely that source of PUFA's would substitute.

#### **Total complex carbohydrates** – increase average non-sugar intake by 25%

- increasing bulk in the diet by consuming more complex carbohydrate will reduce the need to snack on fatty foods between meals
- increasing the proportion of starchy carbohydrates eaten with meals will reduce the need to serve high fat foods to make meals filling.

**Breakfast cereals** – average intake to double

- consumption of breakfast cereals reduces the need/desire to snack on high fat foods throughout the rest of the day
- breakfast cereals are low in fat and some are high in NSP- this will reduce the fat content and also be a filling food
- if breakfast cereals are consumed with semi/skimmed milk this could help reduce fat intake.

**Fish** – white fish consumption to be maintained at current level

- white fish a low fat protein food so would contribute to the reduction of fat in the diet.

**General**

- an interest in healthy eating may be generated by knowledge of the Scottish dietary targets. This interest may result in a change of eating habits eg a reduction of fat.

(b) Critically discuss the dietary and lifestyle factors which may contribute to coronary heart disease.

**Mark allocation:** 15 marks

**A-12-15 marks**

The candidate is able to critically comment on the dietary and lifestyle factors which contribute to coronary heart disease, giving full analysis of the factors.

**B-9-11 marks**

The candidate is able to critically comment on the dietary and lifestyle factors which may contribute to coronary heart disease, giving some analysis of the factors.

**C-7-8 marks**

The candidate is able to critically comment on the dietary and lifestyle factors which may contribute to coronary heart disease, giving limited analysis of the factors.

**Answers should make reference to the following points;**

**Dietary factors**

- too much food – this may lead to obesity. Being obese can make it more difficult for blood to pump through the heart increasing the risk of HBP and CHD
- too much total fat intake – fat is the most concentrated source of energy. Excess fat is stored in the body as fat and may lead to obesity
- too many saturated fats in the diet – these increase the cholesterol levels in the blood
- too much cholesterol in the diet increases the fatty deposits on the arteries
- too many saturated fats may also make the blood more sticky and likely to clot
- too few monounsaturated fats – they reduce low density lipo proteins (high levels increase risk of CHD) which tend to form fatty deposits on artery walls and increase risk of bloods clotting and increase high density lipo proteins (high levels reduce risk of CHD) which help remove fats cholesterol to the liver where it is broken down into bile
- too few polyunsaturated fats – these reduce total blood cholesterol
- too much sugar – high sugar diets are normally deficient in other nutrients and they can also lead to obesity
- too much sugar – dietary sucrose can cause disturbances in the body which are characteristics of diabetes. CHD is a common cause of death in diabetics
- too much salt – high intakes of salt may lead to high blood pressure which leads to CHD
- fibre intake – soluble fibre lowers the levels of cholesterol in the blood by binding with bile salts which are made from cholesterol thus preventing re absorption
- high intake of starchy carbohydrate foods promotes a feeling of fullness, provides a steady supply of energy helping blood sugar levels thus reducing the risk of snacking on high fat foods thus increasing fat intake and risk of obesity
- low consumption of ACE vitamins – ACE vitamins reduce the number of damaging free radicals in the body. It is thought that free radicals cause some cholesterol to become oxidised, causing them to be deposited on the walls of blood cells starting the process of atherosclerosis
- low consumption of oily fish – these are high in omega 3 fats which are thought to reduce the risk of blood clots forming
- high consumption of convenience foods/takeaways due to inability/unwillingness to cook. Many of these foods contain high fat content contributing to CHD
- children have much more choice in relation to food and often make inappropriate choices which have led to obesity and increased risk of CHD in later life.
- food choice may be affected by income/knowledge/location of shops.

**Lifestyle factors**

- cigarette smoking – this is the largest known contributory factor to CHD – increases chance of blood clots forming
- smoking introduces harmful free radicals into the body and destroys anti oxidant vitamins which could then lead to a build up of cholesterol in the arteries
- lack of physical exercise – exercise strengthens the vessels leading to heart muscle and so less likely to develop CHD
- lack of physical exercise – may cause energy intake to exceed energy output thus increasing the risk of obesity and CHD
- regular exercise has a beneficial effect on blood cholesterol levels
- emotional stress – stress can increase blood pressure which increases the risk of CHD
- increased stress in single parent homes may result in increased blood pressure
- high alcohol intake which can lead to HBP and CHD
- less food eaten within household environment therefore less control and responsibility for its nutritional content
- traditional cooking methods such as frying – difficulty in changing to more "healthy" methods
- sedentary lifestyle from an early age contributes to overweight
- time available may affect food choices eg use of convenience foods/take away meals.

2. Discuss the main issues of the debate surrounding the irradiation of foods.

**Mark allocation:** 25 marks

**A-18-25 marks**

The candidate is able to develop a full and coherent discussion of the issues in the debate concerning the irradiation of food. The discussion shows good analysis and the identification of the majority of the main points with full explanation.

**B-15-17 marks**

The candidate is able to develop a discussion of the issues in the debate concerning the irradiation of food. Most of the main points will be identified with explanation.

**C-12-14 marks**

The candidate is able to identify some of the main points with limited discussion.

**Answers should make reference to the following points;**

**For**

- it has been known since the last century that living organisms can be damaged or killed by exposure to certain forms of radiation, so the process is not as new as many would have us believe
- traditional preservation methods eg drying, smoking, curing, addition of salt all change the way the food looks or tastes – irradiation may overcome this
- increasing demands and pressures on food production systems in recent years have led to large sections of the food chain being contaminated, eg poultry frequently contaminated with salmonella, as much as 75% in Europe. The contamination problems using conventional methods of preservation have led scientists to try to improve these techniques, irradiation may be the answer
- the idea of using radiation in this way was proposed in the 1930's but it was too expensive and specialised, development has been rather slow considering the possible benefits
- international organisations such as the UN International Atomic Energy Agency promote its use surely meaning it is an economic and viable method of preservation
- WHO has supported food irradiation as it sees it as a means of reducing food borne disease
- many governments also have concerns about food borne disease and feel irradiation is an easy way to provide safe food
- many governments have concerns about food shortage and irradiation may help with this problem
- some food producing countries such as Ghana and Brazil use decontamination methods which are presently banned on health and safety grounds. Irradiation would help the food export problems they are facing at the moment
- it also has some specific advantages as a food treatment process in certain countries eg it is the only process that can be used to treat raw food such as the Thai nahm sausage which consists of raw pork. It is also the only way of treating sea foods that are traditionally eaten raw
- food manufacturers support irradiation as it enables them to extend the shelf life and storage periods of foods, this allows them to reduce waste and to deliver foods to the shops when it is economically advantageous to do so
- it enables foods such as tropical fruits to be transported all over the world economically
- irradiation can make foods safe by killing harmful micro organisms
- since 1961 exhaustive studies have been carried out regarding the safety of irradiated foods
- modern irradiation plants are completely automated and computer controlled so time and dose levels can be strictly monitored and no people are exposed to radiation at any time
- irradiation plants have to be licensed and are subject to strict inspections
- storage and transport also licensed and subject to strict inspection control

- transportation and storage also subject to close monitoring by government controlled agencies
- it can kill many insects and pests that infest foods such as grains, herbs and spices without appearing to affect them
- it can delay or stop the ripening/decay process so foods can be stored for longer
- it can completely sterilise a food making it suitable for vulnerable patients in hospitals
- it can kill/reduce micro organisms such as salmonella, listeria and campylobacter.

#### **Against**

- effect of radiation on foods varies, it only works successfully on a small number of foods
- in some foods the dosage is critical, a slight overdose can cause foods to have an unpleasant taste and texture
- despite the results from many studies, consumer experts are dissatisfied with some of the conclusions and argue that key experiments have been ignored and that risk assessment methods are suspect
- although there is no hard evidence to show irradiation dosage levels used are dangerous or have harmful effects, very few of the studies have been done for any length of time on humans
- consumer experts fear that changes produced by irradiation may have subtle chemical effects, but that the results may not show up for many years
- studies done have been on selected foods and little is known about the effects on pesticides and other chemical residues on foods
- tests done have been in controlled circumstances, and effects may change when the process is scaled up in a manufacturing environment
- consumer groups protested about the original irradiation label which gave it a positive image, they won and the label in use is less biased
- although all irradiated foods must carry a label intimating the fact, it is difficult to enforce as it is difficult to detect
- no cheap and reliable detection test available
- if irradiation is to be more widely adopted, a cheap and reliable detection system should be a matter of priority for monitoring organisations to use
- it can only be used on a very limited range of foods
- it is relatively expensive
- vitamin E levels can be reduced by 25% and vitamin C by 5-10%, many consumers are unaware of this
- at the dose given about 90% of micro organisms are killed so care still has to be taken with foods
- it is ineffective against viruses
- it can create new substances called radiolytic products – there is controversy over whether such products are dangerous
- supermarkets/shops may have concerns regarding their image/reputation and so choose not to sell irradiated foods
- no agreed common legislation in EU/internationally

3. At each stage of life vitamins are essential components of a healthy diet. Discuss this statement with reference to specific vitamins.

**Mark allocation:** 25 marks

**A-18-25 marks**

The candidate is able to develop a full and coherent discussion of the part played by vitamins in a healthy diet at each stage of life. The discussion shows good analysis and the identification of the majority of the main points with full explanation.

**B-15-17 marks**

The candidate is able to develop a discussion of the part played by vitamins in a healthy diet at each stage of life. Most of the main points will be covered with explanation.

**C-12-14 marks**

The candidate is able to identify some of the main points with limited explanation.

**Answers should make reference to the following points:**

**Vitamin A**

- necessary for formation of visual purple – a pigment found in the retina and required for vision in reduced light.
- necessary for good eyesight especially night vision – important for elderly with failing eyesight
- has anti-oxidant properties – important for middle-aged/elderly/smokers who may be at risk from cancers/disease
- can be toxic in very large quantities especially for the foetus – pregnant women should avoid animal food sources very high in vitamin A (not beta carotene sources)
- required to keep the mucous membranes in the throat, digestive and bronchial and excretory systems moist and free from infection
- required for the maintenance and health of the skin and surface tissues
- required for the normal growth of children, retinol is essential for the growth and metabolism of all body cells
- too much vitamin A in the diet is poisonous as it is stored in the body and can seriously affect skin and joints especially in children
- beta carotene inhibits tumours and improves our immune system.

**Vitamin B complex** (candidates may discuss vit B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>6</sub> separately)

- allows the chemical reaction to occur which releases energy from foods
- especially important for very active people eg teenagers
- elderly must ensure adequate supplies to obtain energy from their food otherwise they will be lethargic
- required for normal growth in children
- important for healthy skin, tongue, digestive and nervous system.

**Folic Acid**

- important for women intending to become pregnant and in the first 3 months of pregnancy – to help prevent spina bifida in the baby and megaloblastic anaemia in mother
- essential for normal growth
- essential for the formation of red blood cells
- required for the release of energy from food
- important for the production of the nucleic acids RNA and DNA
- important for lactating women.

**Vitamin B12**

- important to vegans to prevent pernicious anaemia – must rely on fortified foods
- important for the production of red blood cells
- important for the normal functioning of the nervous system
- involved in the metabolism of protein, carbohydrates and fats.

**Vitamin C**

- necessary for healing wounds/sores – vital for very young and very old and for preventing scurvy
- antioxidant properties beneficial to all groups but especially middle age/elderly/smokers at risk from cancers/disease
- assists with the absorption of iron – essential that teenagers and pregnant women have adequate amounts
- babies being weaned must have adequate supplies of vitamin C to assist with the absorption of iron from food
- required to make connective tissue which binds body cells together
- required for the building and maintenance of skin and linings of the digestive system/may help prevent cancer of digestive tract.

**Vitamin D**

- required to promote the absorption of calcium and phosphorus to build strong bones and teeth – vital for pregnant women for the foetus, young children, adolescents and the elderly
- readily available by the action of sunlight on the skin – elderly who go out less may not take full advantage of this factor – may affect onset of osteomalacia/osteoporosis
- young babies and children who are protected from the sun must have adequate dietary supplies to allow skeletal development
- too much vitamin D can be dangerous as it results in excess absorption of calcium in the blood, this is deposited on the lungs and kidneys and can result in death.

**Vitamin E**

- antioxidant properties – it protects polyunsaturated fatty acids from damage by free radicals, especially cell membranes in the body - beneficial to all groups but especially middle age/elderly/smokers at risk from cancers/disease.

**Vitamin K**

- assists in the production of coagulation factors in the blood to enable it to clot properly after an accident – vital at all stages of life, but newborn babies are given a vitamin K injection immediately after birth to ensure their blood will clot.

4. Discuss the properties of eggs and their use in food products.

**Mark allocation:** 25 marks

**A-18-25 marks**

The candidate is able to develop a full and coherent discussion of the properties of eggs and their use in food products. The discussion shows good analysis and the identification of the majority of the main points with full explanation.

**B-15-17 marks**

The candidate is able to develop a discussion of the properties of eggs and their use in food products. Most of the main points will be identified with limited explanation.

**C-12-14 marks**

The candidate is able to identify some of the main points with limited explanation.

**Answers should make reference to the following points:**

Candidates should be given credit for identifying the property

- eggs increase the nutritional value of dishes
- the protein in egg is of high biological value and consequently considered an important protein food – valuable when manufacturers consider the nutritive value of their products
- eggs contain valuable amounts of iron, vitamin A and calcium - valuable when manufacturers consider the nutritive value of their products
- contain small amounts of riboflavin, vitamin D and thiamine - valuable when manufacturers consider the nutritive value of their products
- cooking eggs reduces the vitamin B content
- due to high fat content in the yolk, more than a couple a week can raise blood cholesterol levels – may have implications to manufacturer when considering the ‘health’ of a product
- eggs are an inexpensive ingredient with many properties so are an invaluable component of many foods
- when heat is applied the eggs coagulate to produce a rigid structure
- when eggs are heated, the protein in the white and the yolk coagulates
- egg white proteins coagulate first at about 60 degrees C. The white becomes opaque and forms a gel.
- yolk proteins coagulate at 66 degrees C and the yolk thickens
- coagulation of protein is responsible for the thickening effect eggs have in products eg egg custard, quiche, lemon curd
- coagulation of egg custard produces a gel
- the firmness of the final product or custard will depend on the proportion of ingredients eg eggs to milk
- the firmness will also depend on the addition of other ingredients eg addition of sugar raises the temperature for coagulation and produces a softer texture
- the rate of coagulation is increased by the addition of salt and acid – important manufacturers know this as end product may be affected
- thickening agent – egg proteins coagulate thus enabling mixtures to thicken, eg egg custard
- binding agent – coagulation of protein enables mixtures to hold together on cooking eg rissoles
- coating – egg sets and hold breadcrumbs in place eg Scotch eggs
- emulsifying agent – egg yolk contains lecithin which is an emulsifying agent used in the production of mayonnaise
- foaming – when egg whites are beaten, air is incorporated and the protein partially coagulates as a foam. Meringues are prepared in this way
- in whisked sponges the entrapped air is the primary leavening agent and air bubbles expand from the heat. Steam from water enters the air bubble and expands them further

- when whisking egg whites foaming may be promoted by the addition of an acidic substance such as vinegar. This lowers the pH value – could be used by manufacturers to make the foam more stable eg in pavlova
- over beating of egg white results in denaturation of the protein – foam collapses resulting in loss of volume
- over coagulation of eggs during cooking can have a detrimental effect on food products as the egg can become rubbery and may separate leaving a watery liquid to seep out
- aeration – eggs are used in creamed mixtures to produce lightness in products
- flavour – eggs provide a rich flavour to otherwise insipid products
- colour – eggs add a rich colour to otherwise pale products
- coating – eggs can be used in conjunction with breadcrumbs to coat food to protect it whilst cooking, eg fish and scotch eggs
- iron sulphide is formed round egg yolks during cooking and causes black discolouration when eggs have been hard boiled. This happens most with stale eggs, but it can be reduced by placing them in cold water immediately after boiling – important eg in the production of scotch eggs
- the shell of an egg is porous so care must be taken prior to manufacture to ensure odours are not allowed to enter the shell
- bacteria may also enter the egg through the shell, so again safe storage is required to reduce the risk of salmonella.

5. Discuss the role of food legislation and the Food Standards Agency in relation to food safety.

**Mark allocation:** 25 marks

**A-18-25 marks**

The candidate is able to develop a full and coherent discussion of the role of both food legislation and the food standards agency in ensuring food safety. The discussion shows good analysis and the identification of the majority of the main points with full explanation.

**B-15-17 marks**

The candidate is able to develop a discussion of the role of both food legislation and the food standards agency in ensuring food safety. Most of the main points will be identified with limited explanation.

**C-12-14 marks**

The candidate is able to identify some of the main points with limited explanation.

**Answers should make reference to the following points:**

**Food Safety Act 1990**

- a wide ranging act which has strengthened and updated previous legislation regarding food safety
- aims to ensure all food produced for sale is safe to eat, reaches quality expectations and is not misleadingly presented
- covers the whole food chain from the farm or factory to point of sale – ensures safe food for consumers (Food must not be injurious to health, unfit to eat or contaminated)
- anyone working in the food business must conform to this Act, and food premises must be registered – ensures good hygiene standards for consumers
- all food handlers have to undergo food hygiene training therefore the consumer should be protected from the risk of food poisoning
- act makes it an offence to produce or sell any food which is injurious to health
- provides legal powers and penalties to enforce the act. These duties are carried out by environmental health departments in relation to food hygiene issues and by trading standards in relation to food labelling etc
- food labelling must be accurate – this relates to storage/cooking instructions and possible ingredients/ additives which may cause allergies
- enforcement officers have the right to inspect food sources and to take action when an offence has been committed
- enables us to fit in with the requirements of the EU
- allows us to keep pace with technological change.

**Food Safety (Temperature Control) Regulations (1995)**

- states that the maximum temperature of 8° C is the specific requirement for all foods that could support the development of harmful pathogenic micro-organisms or the formation of toxins
- regulations cover all food stuffs including raw materials and ingredients
- they apply to all stages from transport, preparation, processing, storage, manufacturing, catering and retailing
- even if food is kept below 8° C, if it is known to support the growth of pathogenic bacteria at say 5° C, the law is breached
- food which is to be reheated before serving must reach a temperature of not less than 82° C
- foods which are to be cooled must be done as quickly as possible after cooking
- environmental Health Officers enforce the regulations.

### **Quick Frozen Foodstuffs Regulations 1990**

- requires frozen foods to be stored at minus 18 °C and transported at between minus 15-18° C.

### **Food Safety (General Food Hygiene Regulations) 1995**

- regulations cover 3 main areas
  - temperature control
  - general food hygiene
  - hazard analysis and risk assessment
- anyone who processes or sells food is covered by these regulations and are legally bound to make sure they carry out their operations safely and hygienically
- they ensure that all sellers/processors of food must identify all steps in their activities which are critical to food safety – emphasis on controlling risk (HACCP)
- food premises must be clean and in good repair – examples may be given
- no foods should be kept at temperatures which would result in a risk to health.

### **The Food Standards Agency (FSA) has the following role in improving food safety**

- FSA provides independent advice and information to consumers and the Government on food safety from farm to fork so ensuring safer food for consumers and reducing food related illnesses
- to formulate policy and advise government on all aspects of food safety and standards
- FSA protects the consumer through effective enforcement/monitoring of food related regulations and policies
- FSA helped in the development of food labelling to give more accurate information to help with the safe storage of food and therefore help prevent outbreaks of food poisoning
- FSA gives advice to the public on food safety matters, therefore raises awareness and helps to educate the public through leaflets, posters and a web site which has on line experts on nutrition and health to answer queries
- FSA commissions research into food safety matters eg labelling to ensure the public are kept up to date
- controlling genetically modified food for human consumption to ensure consumer safe food
- monitoring the use of food additives
- licensing and inspection of manufacturers who produce irradiated food
- protecting public health against contaminants in food
- looking at and controlling the production of new "novel" foods being developed by manufacturers
- representing the UK on matters of food safety and food standards in the EU and world wide
- to work in an open way by holding meetings in public and seeking and publishing people's views
- to link with industry to keep up with technological developments to ensure best methods of ensuring high standards of quality and safety consumers deserve

**ADVANCED HIGHER HOME ECONOMICS  
RESOURCE MANAGEMENT**

**Context : Health and Food Technology**

Question	Context	Elaboration	Skills		Totals
			Knowledge	Evaluation	
<b>Section A</b>					
<b>(a)</b>	Food politics	<ul style="list-style-type: none"> <li>• Food and nutrition and health policies – Scotland and abroad</li> </ul>	5		
<b>(b)</b>	Biochemistry, preservation and processing	<ul style="list-style-type: none"> <li>• Issues related to health in Scotland</li> <li>• Fast foods – in a social context eg school</li> </ul>	10		
<b>(c)</b>	Psychology of food	<ul style="list-style-type: none"> <li>• Consumers attitudes to food issues</li> <li>• Role / impact of the media</li> </ul>		10	25
<b>Section B</b>					
<b>1(a)</b>	Food politics	<ul style="list-style-type: none"> <li>• Food and nutrition and health policies – Scotland and abroad</li> </ul>			
<b>(b)</b>		<ul style="list-style-type: none"> <li>• Issues related to health in Scotland</li> </ul>	10	15	25
<b>2</b>	Biochemistry, preservation and processing	<ul style="list-style-type: none"> <li>• Irradiation of foods</li> </ul>	25		25
<b>3</b>	Food Science	<ul style="list-style-type: none"> <li>• Anti – oxidants</li> <li>• Micro nutrients and optimal nutrition</li> </ul>	25		25

Question	Context	Elaboration	Skills		Totals
			Knowledge	Evaluation	
4	Food Science Food commodities	<ul style="list-style-type: none"> <li>• The properties of food and uses of proteins</li> <li>• Dairy foods, milk and milk products and eggs</li> <li>• Cereals and baked goods</li> </ul>	25		25
5	The food chain Food politics	<ul style="list-style-type: none"> <li>• Food Hygiene issues</li> <li>• Micro biology and food hygiene</li> <li>• The role of the Food Standards Agency</li> </ul>	25		25

[END OF MARKING INSTRUCTIONS]