

GCE

Home Economics (Food, Nutrition and Health)

Unit G004: Nutrition and Food Production

Advanced GCE

Mark Scheme for June 2018

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Annotation	Meaning
BP	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
?	Unclear
BOD	Benefit of doubt
λ	Caret sign to show omission
NAQ	Not answered question
REP	Repeat
SEEN	Noted but no credit given
✓	Tick
×	Cross
ш	Level 1
L2	Level 2
L3	Level 3
L4	Level 4
VG	Vague

MARK SCHEME: Nutrition and Food Production (A2)

C	uesti	on	Answer/Indicative content	Mark	Guidance
1	а	i	Identify one good source of dietary fibre in the diet. ONE MARK available for correct answer. Sources: Beans Grains Wholegrain/wholemeal bread Wholegrain/wholemeal pasta Brown/wholegrain rice Pulses Nuts Potatoes eaten with the skin Dried fruit Bran based cereal Porridge Fruit Vegetables Credit will be given for any valid point.	1	If pasta, rice or bread it should say wholemeal or whole grain Do not accept 'cereals'
1	а	ii	 Adds bulk to the faeces/water binding capacity/aids digestion/assists the passage of waste products through the intestines (1) Preventing constipation/reducing bowel cancer risk (1) Reduce the level of cholesterol in blood (1) helps to reduce the risk of CHD Slows down the release of glucose to the bloodstream (1) important to diabetics (1) The stomach may feel full for longer (1) so fibre can contribute to weight loss diets (1) 	2	TWO MARKS available for answers describing a clear function. ONE MARK for a statement only and no description. Bowel disease/health is too vague

(Questi	ion	Answer/Indicative content	Mark	Guidance
			Credit will be given for all valid points.		
1	b	i	Name the two types of vitamin A found in food. TWO MARKS available. • Beta carotene/carotene (1) • Retinol (1)	2	
1	b	ii	 Describe one function of vitamin A in the body. Helps vision in dim light (1) retinol is required for the development of the retina/rhodopsin Maintains mucous membranes e.g. nose, throat (1) helps to prevent infections (1) Required for growth/embryo development (1) development/formation of the heart, eyes, and ears/a lack means slow growth (1) maintains the immune system/antibodies (1) component of all cells (1) Credit will be given for all valid points. 	2	TWO MARKS available for answers with a clear description. ONE MARK for a brief response. 'Helps vision' MUST refer to dim/poor light/night vision
1	b	iii	 Identify one symptom of a vitamin A deficiency in children. Night blindness/unable to see in dim light Weakened immune system Poor growth in children 	1	ONE MARK for named symptom.
1	С		 Explain the relationship between Vitamin C and iron in the diet. Vitamin C has a relationship with iron regarding its absorption into the body (1) a reference to the ferrous state for adequate absorption (1) Iron needs to be in a 	2	TWO MARKS are available. Two marks for explaining the relationship fully. ONE required.

C	Questi	ion	Answer/Indicative content	Mark	Guidance
			reduced ferrous state for absorption/Vitamin C helps the absorption because it reduces ferric iron to the absorbable ferrous state (1)		Haem iron (ferrous iron) is present in meat, liver, offal and meat products. Non-haem iron (ferric iron) is found in plant foods such as cereals, vegetables, pulses, dried fruit.
1	d	i	 Describe one behaviour change which occurs during the kneading of bread dough. Proteins form into gluten (1) Strong wheat flour contains the proteins glutenin and gliadin (1) makes the dough stretchy (1) Kneading creates stronger links between the protein (1) gluten strands align/dough is becomes stretchy (1) Kneading incorporates oxygen/air and water into the dough (1) Oxygen/air and water helps to give strength to the gluten/Kneading makes strong/stretchy dough (1) Credit will be given for all valid points. 	2	TWO MARKS are available. Two marks for describing the behaviour change fully. ONE required.
1	d	ii	 Describe one behaviour change which occurs during the rising of bread dough. During fermentation bread dough produces carbon dioxide (1) carbon dioxide is formed from the breakdown of starch/sugars in the flour (1) Yeast uses sugars to make carbon dioxide and water (1) enzymes present in yeast and flour also help to speed up this reaction (1). Carbon dioxide causes the dough to rise (1) fermentation/proving increases in dough size occurs as these cells fill with gas (1) Credit will be given for all valid points. 	2	TWO MARKS are available. Two marks for describing the behaviour change fully. ONE required. Do not credit 'air pockets' the gas is carbon dioxide.

C	uesti	ion	Answer/Indicative content	Mark	Guidance
1	d	iii	Describe one behaviour change which occurs during the baking of bread dough. • Carbon dioxide expands with heat/steam forms as the water is heated (1) pushes the dough upwards and outwards/bread increases in size/rises (1) • Stretchy gluten mesh expands with the carbon dioxide and steam (1) the starch/protein in the dough gelatinizes or sets/fixing the bubbles in place (1)	2	TWO MARKS are available. Two marks for describing the behaviour change fully. ONE required.
			 Liquids evaporate/dry hard crust forms due to loss of moisture and gas escape (1) The bread becomes light weight due to loss of moisture/aromas are released (1) Enzymes are inactivated/denature (1) production of carbon dioxide stops (1) Crust turns brown (1) action of steam release/heat on the surface of the bread forms dextrin/dextrinisation which caramelises the crust/Maillard reaction (1) Credit will be given for all valid points. 		
1	e		Discuss the value of nutritional labelling to the consumer. Answers may include: Informs the consumer about the nutritional value of a product. The nutritional information stated on labels must comply with EC regulations and may be listed as: Group 1 Group 2 Energy Energy Protein Protein Carbohydrate Carbohydrate Fat Sugars Saturates Fibre Sodium		Level 3 (5-6 marks) Candidates are able to demonstrate clear knowledge of the value of nutritional labelling to the consumer. The discussion will be detailed. The discussion will be well developed and supported by the use of subject specific examples. Ideas will be expressed clearly and fluently. Level 2 (3-4 marks) Candidates are able to demonstrate satisfactorily knowledge of the value of nutritional labelling to the consumer. The discussion will show understanding. The discussion may not be fully developed and may lack specific examples.

Question	Answer/Indicative content	Mark	Guidance
	 Traffic light labelling system allows consumers to quickly assess the nutritional value of the product. Makes the consumer aware of correct portion size. Consumers can compare products/information must be declared per 100 grams/100 mls. Consumers can follow dietary goals or guidelines/make informed choices and can select food with a specific nutritional content e.g. low in fat Energy content in Kcals/joules of a product is important for consumers wishing to control their energy intake e.g. calorie controlled diet Protein content maybe significant for those following a high protein diet Fat including the saturates content is significant to consumers wishing to reduce their intake Sugar and fat content will be significant to diabetics. Sodium content may help those wishing to control blood pressure. Fortification with vitamins or minerals will be indicated Vitamins and minerals must be shown as a percentage of the reference nutrient intake Polyunsaturates, monounsaturates and cholesterol may also be mentioned and help inform consumer wishing to monitor their fat intake. Credit will be given for all valid points. 		Level 1 (1-2 marks) Candidates are able to demonstrate superficial knowledge of the value of nutritional labelling to the consumer. They will show very limited understanding. O marks No response worthy of credit.
1 f i	Explain the term malnutrition.	2	
	 One mark for an explanation that acknowledges an imbalance of nutrients/poor or bad nutrition. One mark for malnutrition is a deficiency or excess of nutrients that causes adverse effects on health and wellbeing. 		TWO MARKS are available. Two marks for explaining the term fully. ONE required. A lack of vitamins/minerals too vague

Question	Answer/Indicative content	Mark	Guidance
1 f ii	Name one disease that is linked to malnutrition in children. Rickets Obesity Tooth decay Kwashiorkor/marasmus Anaemia Type 2 diabetes Credit will be given for all valid points.	1	ONE MARK for named disease.
2	 Discuss how the nutritional value, choice and use of meat can contribute to health. Mutritional value of meat Meat is protein that is of high biological value Fat is present in varying quantities, depending on the type and cut of meat. Meat is a valuable source of iron, present as haem iron, and contains the minerals zinc, potassium and phosphorus and the vitamins thiamin, riboflavin, niacin and B12. Lean meat contains very little vitamin A and almost no vitamin D, vitamin C or carbohydrate. Vitamin A is found in liver at high levels which may be toxic if consumed in high quantities. Pregnant women should avoid liver and liver products. Sodium is available in gammon and bacon. Energy (calories) are provided by meat. Red meat is high in energy and white meat is low in energy. Choice of meat References to colour pigments in meat (myosin) and 	25	Level 4 (19-25 marks) The candidate demonstrates an accurate knowledge of how the nutritional value, choice and use of meat can contribute to health. The discussion of their significance will be detailed. The information will be presented in a fluent and well-structured manner. Subject specific terminology will be used accurately. There will be few, if any errors of grammar, punctuation and spelling. Level 3 (13-18 marks) The candidate demonstrates a good knowledge of how the nutritional value, choice and use of meat can contribute to health. The discussion of their significance will show good understanding. The information will be presented clearly and some subject specific terminology will be used. There may be occasional errors of grammar; punctuation and spelling. Level 2 (7-12 marks) The candidate demonstrates some knowledge of how the nutritional value, choice and use of meat can contribute to

Question	Answer/Indicative content	Mark	Guidance
	 choice. Beef most commonly used cuts are topside, steak, minced beef and brisket. Pork most commonly used cuts are leg, chop and belly. Bacon and gammon are the cured flesh of a pig. The meat is cured by salting and smoking or by soaking in brine followed by smoking. Lamb most frequently used cuts are chops, shoulder, leg, and breast. Chicken is the most popular type of poultry. Other types are duck, goose and turkey. Poultry has less connective tissue than red meat so is often more tender. Game feathered (grouse, pheasant, partridge and ostrich) and furred (rabbit, hare and venison). A wide variety of meat products are available, including curries, sausages, pies, burgers and pâté. Products such as gelatine and stock cubes are also by-products of the meat processing industry. Individuals with health concerns should avoid fatty or processed meats. Meat sources made be referenced e.g. organic, free range, local. Wse of meat References to the muscle tissue (collagen and gelatin) and appropriate cooking/preparation methods. Grilling/BBQ is suitable for tender cuts of meat. It is a healthy method of cooking because any fat present can drip down and away from the meat. Shallow frying is suitable for tender cuts of meat, such as chicken cut into strips. Roasting is a dry method of cooking involving baking a 		health. The discussion of their significance will show a limited understanding and may lack detail. The information will be presented simply and some subject specific terminology will be used, although not always used appropriately. There will be errors of grammar, punctuation and spelling. Level 1 (1-6 marks) The candidate demonstrates superficial knowledge of how the nutritional value, choice and use of meat can contribute to health. They will show very limited understanding. The information will be poorly expressed with little or no use of subject specific terminology. Errors of grammar, punctuation and spelling may be intrusive. O marks No response worthy of credit.

Question	Answer/Indicative content	Mark	Guidance
	 whole joint of meat in the oven. A variety of meats can be roasted. Braising means cooking meat or poultry with the addition of some stock. A variety of meats can be braised including brisket. Stewing is cooking in a small amount of liquid, which is simmered slowly; the liquid is served with the meat. Credit will be given for all valid points. 		
3	Discuss how a balanced diet can contribute to the health of the elderly. Answers may include: Nutritional needs of the elderly Energy requirements decrease gradually after the age of 50 in women and age 60 in men because of the reduction in physical activity. Protein requirements decrease for men but continue to increase slightly in women/Protein is used for repair. The requirement for vitamins remains the same but an elderly person's diet is more likely to be deficient in vitamin C, D and folate. B12 requirements may increase to low consumption of red meats. Elderly people are thought not to consume enough green leafy vegetables which would account for the lack of folate in the diet. The elderly who are housebound may be lacking in vitamin D because they may have limited exposure to sunlight, Foods that are rich in vitamin D and calcium should therefore be included in the diet. If dexterity is a problem in peeling fruit or potatoes then they may lack	25	Level 4 (19-25 marks) The candidate demonstrates an accurate knowledge of how a balanced diet can contribute to the health of the elderly. The information will be presented in a fluent and well-structured manner. Subject specific terminology will be used accurately. There will be few, if any errors of grammar, punctuation and spelling. Level 3 (13-18 marks) The candidate demonstrates a good knowledge of how a balanced diet can contribute to the health of the elderly. The discussion will show good understanding. The information will be presented clearly and some subject specific terminology will be used. There may be occasional errors of grammar; punctuation and spelling. Level 2 (7-12 marks) The candidate demonstrates some knowledge of how a balanced diet can contribute to the health of the elderly. The discussion will show a limited understanding and may lack detail. The information will be presented simply and some

Question	Answer/Indicative content	Mark	Guidance
	 Omega 3 fatty acids can help with arthritis/brain function. The requirements for minerals remain the same but an elderly person's diet would benefit from the recommended amounts of Iron, Zinc and calcium. Anaemia can occur in elderly people due to poor absorption and blood loss so foods rich in Iron should therefore be included in the diet. Zinc is needed for a healthy immune system and to help with wound healing such as pressure sores and leg ulcers. Therefore the elderly would benefit from adequate requirements of zinc. Lack of zinc is also thought to be a factor in dementia. Adequate intakes of calcium should be included in the diet of the elderly for good bone health. Elderly people who are well should restrict saturated fat intakes. Some elderly people may suffer with constipation and bowel problems due to a reduced gut mobility and inactivity. The consumption of cereals can help this. If the elderly are dehydrated it can interfere with digestion and may lead to constipation. It is therefore very important to drink a variety of drinks to keep water intake up. Physical ailments can restrict the ability to prepare food and contribute to the risk of malnutrition e.g. arthritis, poor dentures etc. Dietary needs of the elderly The elderly should aim to eat meals based upon starchy foods – pasta, potatoes, rice and bread. These are filling sources of carbohydrate. A useful source of protein is oily fish; consumption of oily fish may help reduce the risk of thrombosis. Fruit and vegetables provide valuable vitamins, minerals and fibre. They also contain antioxidants. 		used appropriately. There will be errors of grammar, punctuation and spelling. Level 1 (1-6 marks) The candidate demonstrates superficial knowledge of how a balanced diet can contribute to the health of the elderly. They will show very limited understanding. The information will be poorly expressed with little or no use of subject specific terminology. Errors of grammar, punctuation and spelling may be intrusive. O marks No response worthy of credit. Reference nutrient intakes for the elderly must be accurate.

Question	Answer/Indicative content	Mark	Guidance
	 Antioxidants mop up damaging 'free radicals'. Antioxidant vitamins (A, C, E) and minerals (zinc, copper, manganese, selenium) in fruit and vegetables can stop free radicals in their tracks. An intake of iron is very important and should come from haem (meat, offal) and non-haem sources (fortified cereals, dried fruit, pulses and green leafy vegetables) every day. Absorption of iron is increased by consuming vitamin C at the same time, such as a glass of fruit juice with meals. An intake of zinc is very important; zinc is found in meat and meat products, seafood, milk and dairy products, wholemeal bread, lentils, eggs, nuts, sweetcorn and rice. lodine is required for the production of thyroxine/healthy thyroid gland. Sodium intake should be reduced to avoid the risk of high blood pressure. Calcium-rich foods such as: milk, cheese and other dairy products, green leafy vegetables, sesame seeds, bony fish, dried fruit and baked beans are needed for good bone health. For those elderly people who live alone they should cook at least one well balanced meal a day. This does not necessarily have to be a hot meal. It is also useful for them to have a well-stocked store cupboard full of essential items such as long life milk, cereals, canned foods, pulses, pasta, and a freezer with some readymade meals, bread in case they are ill or housebound. 		
4	Discuss the costs involved from the design to the launch of a new food product.	25	
	Answer may include:		Level 4 (19-25 marks) The candidate demonstrates an accurate knowledge of the

Question	Answer/Indicative content	Mark	Guidance
Question	Design and development Analysing a need for a new product may involve the modification of an existing less profitable product or the development of a completely new innovative product. Identification of gap in the market or modification of an existing product can be achieved by market research. Market research is expensive and time consuming. Product Development Manager will be employed to oversee the whole process and will make decisions on ingredients/materials/manufacturing process. Market research is expensive/use of questionnaire, survey of competition and disassembly of existing products. Qualitative research/interviews with the target group i.e. Health aware adults to find out their reaction to different low fat/reduced calorie products. This is time consuming and therefore expensive. Quantitative research involving the large-scale study of factual data of consumption patterns and market size. Access to this data will incur costs. The gathering, handling, analysing and interpreting of the data will assist the development of the ideas. Statisticians may be required to be employed. Design possibilities explored with the development of a product specification and product prototypes for the new product. The use of CAD will be employed to model ideas. Equipment and software will incur costs. Costing of raw materials and the reliability of supplies will be examined. Importing ingredients/cost. Producers may have to follow regulations and implementing legislation/cost. A buyer will ensure the product remains profitable/will seek out the best possible quality for maximum profitability. Bulk purchases discounts cost. Development of a selected product to include sensory	Mark	costs involved from the design to the launch of a new food product. The discussion will be detailed. The information will be presented in a fluent and well-structured manner. Subject specific terminology will be used accurately. There will be few, if any errors of grammar, punctuation and spelling. Level 3 (13-18 marks) The candidate demonstrates a good knowledge of the costs involved from the design to the launch of a new food product. The discussion will show good understanding. The information will be presented clearly and some subject specific terminology will be used. There may be occasional errors of grammar, punctuation and spelling. Level 2 (7-12 marks) The candidate demonstrates some knowledge of the costs involved from the design to the launch of a new food product. The discussion will show a limited understanding and may lack detail. The information will be presented simply and some subject specific terminology will be used, although not always used appropriately. There will be errors of grammar, punctuation and spelling. Level 1 (1-6 marks) The candidate demonstrates superficial knowledge of the costs involved from the design to the launch of a new food product. They will show very limited understanding. The information will be poorly expressed with little or no use of subject specific terminology. Errors of grammar, punctuation and spelling may be intrusive. O marks No response worthy of credit.
	testing and piloting small trials. Consumer trials are		Responses must link to cost and not just describe the stages.

Question Answer/Indicative content	Mark	Guidance	
expensive to manage. Production Engineer will be employed to produce a production schedule/may involve developing a specific piece of machinery to perform a particular task. The system will be controlled by HACCP/ Products that are high-risk will require stringent safety tests, which will add to the production costs. Microbiologist employed to carry out safety checks/surveillance. Quality control and quality assurance systems will be used. Production of the food product may be large scale and will be controlled by a CAM system/may be expensive. Fixed costs are maintenance, staff salaries, and fuel and insurance costs. Variable costs are affected by output and include the cost of ingredients, packaging materials, running costs of machinery. New machinery may be rented/purchased or existing machinery may need calibrating for new production system. Labour costs. Staff may require training; specialist skills may be required for production. Staff may be required to work shifts, which means labour costs may increase. The establishment of a distribution system for the product. Refrigerated storage and transportation may be required for perishable food products. Ideas for packaging will also be explored and the legal requirements for food labelling followed. Launch Marketing Manager will be employed to assess the market and will be involved in the development of packaging and advertising campaigns.	Wark	Guidance	

Question	Answer/Indicative content	Mark	Guidance
	 relating to the manufacture and sale of food. Advertising a new or modified product can be achieved by using television, Internet, magazines, newspapers, flyers, radio and cinema. The advert will have a target audience and research into their needs/wants will be required. Advertising in store by promotional methods including free samples, money off coupons, loss leaders, competitions, bonus loyalty card points etc. Staff conduct personal selling. This may encourage a consumer to try a new product and provide feedback for the retailer but is expensive to maintain. Merchandising is an attempt at the point of sale/ use of a recipe in a magazine/celebrity endorsement. Packaging must be appropriate for the food product. The consumer will link the quality and design of the packaging with quality of the product itself. Exhibitions and trade shows e.g. Good Food Show can also be used to launch a new product to the public. Credit will be given for all valid points. 		

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