

GCE

Home Economics (Food, Nutrition and Health)

Unit **G004**: Nutrition and Food Production

Advanced GCE

Mark Scheme for June 2015

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MARK SCHEME: Nutrition and Food Production (A2)

Question			Answer	Mark	Guidance
1	a	i	Identify two foods that are a good source of animal protein. ONE MARK for one source. TWO Maximum. <ul style="list-style-type: none"> • Meat • Poultry • Fish • Dairy products • Eggs 	2	
		ii	Give one function of protein in the body. ONE MARK for one function. <ul style="list-style-type: none"> • Growth/cell/enzyme formation • Repair/maintenance • Energy 	1	
		iii	Explain what is meant by protein complementation. TWO MARKS are available. Protein complementation is about combining 2 sources of protein together (1) to get the 10 essential amino acids (1).	2	
	b	i	Identify two different good sources of vitamin B3 (niacin). TWO MARKS are available. <ul style="list-style-type: none"> • Poultry • Red meat • Tuna/Salmon/shrimp • Peanuts • Milk • Eggs • Broccoli • Carrots • Avocados • Pulses • Potatoes/sweet 	2	

Question	Answer	Mark	Guidance
	<ul style="list-style-type: none"> • Mushrooms • Tomatoes • Dates • Brown rice • Fortified cereals. • Bread <p>ii State one function of vitamin B3 (niacin). ONE MARK for one function.</p> <ul style="list-style-type: none"> • Niacin is essential in the metabolism of carbohydrates, fats and proteins to produce energy. The energy is used for body growth. • Niacin maintains a healthy skin, keeps the digestive and nervous system working well. • Niacin is essential to the production of hormones including oestrogen and insulin. <p>iii State the deficiency disease associated with vitamin B3 (niacin). ONE MARK for pellagra.</p> <p>c i Explain how food processing affects the vitamin C content of fruit. TWO MARKS are available. The enzyme ascorbic acid oxidase will destroy the vitamin C content (1). Processing/cooking/by bruising, cutting, slicing and exposure to the air will effect vitamin C (1).</p> <p>ii Explain two ways vitamin C can be retained in fruit and vegetables during storage. TWO MARKS are available for each explanation. Explanations must be linked to storage.</p> <ul style="list-style-type: none"> • Storing in its natural form/avoid bruising/damaging fruit and vegetables (1) as cell walls are broken and 	<p>1</p> <p>1</p> <p>2</p> <p>4</p>	

Question	Answer	Mark	Guidance
d	<p>enzymes are released (1).</p> <ul style="list-style-type: none"> • Choose young/not over ripe fruit and vegetables (1), as they will contain the greatest quantity of vitamin C (1). • Use shortly after purchase (1) long storage reduces content (1). • Cut raw fruits and vegetables should be stored in an airtight container/bag (1) Vitamin C is lost when exposed to oxygen (1) • Leave in modified atmosphere bags for as long as possible (1) slows the process of oxidation down (1). • Store in cool/fridge/freezer (1) Enzymes are active at room temperature (1) • Store in dark places (1) Sunlight can also destroy vitamin C (1) <p>Explain three factors that can affect an individual's energy requirement. ONE MARK is available for each correctly identified factor. ONE MARK for a valid explanation of how the factor may affect energy consumption.</p> <p>Rate of growth/Age (1)</p> <ul style="list-style-type: none"> • Young children/adolescents have higher relative metabolic rates than adults. They require more energy in relation to their size than adults. This is because they are generally more active and are growing rapidly. • With increasing age energy requirements decrease. This is partly due to a reduction in physical activity and a reduction in lean body mass. <p>Gender (1)</p> <ul style="list-style-type: none"> • In general the larger the body mass the greater the energy expenditure. • Men require more energy than woman because they tend to have a larger overall body size and higher lean to fat ratio than women. 	6	

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	<ul style="list-style-type: none"> • The metabolic rate is higher and they tend to use more energy. <p>Activity level/Occupation/Lifestyle (1)</p> <ul style="list-style-type: none"> • Sedentary occupations including office workers, drivers, shop workers and those following a sedentary lifestyle require less energy. • Moderately active occupations including light industrial workers require more energy. • Very active occupations e.g. builders' labourers, steel workers require the greatest physical exertion and therefore have the largest energy requirement. • Athletes who train for long periods of time will require a greater energy intake. <p>Pregnancy (1) Extra energy is required for the healthy growth and development of the baby.</p> <p>Lactation(1) the production of breast milk requires extra energy.</p> <p>Illness (1) the metabolic rate rises during a fever and may decrease due to reduction on physical activity.</p> <p>Weight reduction(1) to lose weight a person must reduce their energy consumption from food.</p> <p>Body composition (1) lean body tissue is metabolically more active and uses more energy than adipose tissue.</p> <p>Hormonal imbalance (1) overactive thyroid gland can increase the metabolic rate</p>		

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e	<p>and individuals may need to consume more energy to address the imbalance.</p> <p>Environmental conditions (1) Food plays a role in prevention of hypothermia since it is the primary source of fuel for body heat production. A high-energy intake is required when working or living in extremely cold environments.</p> <p>Explain two for consumers advantages of sugar substitutes. TWO MARKS are available for each explanation.</p> <ul style="list-style-type: none"> • Sweeteners allow diabetics (1) to enjoy an alternative to sugar without affecting their blood glucose levels (1). • Sweeteners are useful for weight control (1) they are low energy/calorie (1). • Sweeteners are useful for prevention of tooth decay (1) Unlike sugar, artificial sweeteners don't contribute to tooth decay(1). • More consumer choice of low calorie sugary foods (1) consumer to make healthier food choices/low energy food choice (1) • More consumer choice of low calorie ingredients (1) consumer to make low calorie/energy foods at home (1) 	4	

Question	Answer	Mark	Guidance
2	<p>SECTION B Discuss the nutritional and dietary needs of the elderly. Nutritional needs of the elderly.</p> <ul style="list-style-type: none"> • 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. • 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. • 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 sufficient vitamin C. • 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. 		<p>Level 4 19-25 marks The candidate demonstrates an accurate knowledge of the nutritional and dietary needs of the elderly. 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.</p> <p>Level 3 13-18 marks The candidate demonstrates a good knowledge of the nutritional and dietary needs of the elderly. The discussion will show 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 are able to explain satisfactorily.</p> <p>Level 2 7-12 marks The candidate demonstrates some knowledge of the nutritional and dietary needs of the elderly. 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.</p> <p>Level 1 1-6 marks The candidate demonstrates superficial knowledge of the nutritional/dietary needs 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.</p> <p>0=no response worthy of credit</p>

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	<ul style="list-style-type: none"> • 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. <p>Dietary needs of the elderly</p> <ul style="list-style-type: none"> • 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. Antioxidants mop up damaging 'free radicals'. • Crucial 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. • 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. 		

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3	<ul style="list-style-type: none"> • 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 ready made meals, bread in case they are ill or housebound. <p>Credit will be given for all valid points.</p> <p>Discuss how social change and concerns about health have affected the food industry.</p> <p>Health issues</p> <ul style="list-style-type: none"> • Consumer interest and knowledge of diet has increased. Functional foods such as lower cholesterol spreads, probiotic drinks have been introduced. • Food manufacturers develop products to meet the demands for healthier lifestyles e.g. Low fat ready meals/vegetarian/vegan foods • Retailers are more responsive to special diets e.g. gluten free products. • Artificial sweeteners developed for products requiring sweetness but low energy. • The use of food additives in products aimed at children has decreased as public concern about the effect of additives has increased. • Manufacturers use nutritional food labelling to inform consumers about products e.g. RI • Reduced use of hydrogenated fats by some food manufacturers. • Consumption of fruit and vegetables has increased e.g. 5 a day campaign • School meals and the choice of food eaten inside schools have changed. Department for Education guidelines mean meals must include at least two 		<p>Level 4 19-25 marks</p> <p>The candidate demonstrates an accurate knowledge and makes a judgement on how social change and concerns about health have affected the food industry. 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.</p> <p>Level 3 13-18 marks</p> <p>The candidate demonstrates a good knowledge on how social change and concerns about health have affected the food industry. The discussion will show 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 are able to explain satisfactorily.</p> <p>Level 2 7-12 marks</p> <p>The candidate demonstrates some knowledge of how social change and concerns about health have affected the food industry. The discussion will show a limited understanding and may lack detail. The information will be presented simply</p>

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	<p>portions of fruit and vegetables and deep-fried foods are restricted.</p> <ul style="list-style-type: none"> • Television advertising of junk food aimed at children has been restricted. <p>Social factors</p> <ul style="list-style-type: none"> • Due to better communication and globalisation individuals are more aware of fashions and social trends. This has an impact on the food we purchase and eat. • Where we live and the lifestyle we lead affects our consumption of food. • People eat at different times within a family/ household unit e.g. microwaveable food. • Increased leisure time for families and individuals means that less time may be spent in the home preparing meals. More products are available requiring limited preparation e.g. part cooked meals, stir in sauces. • Price ranges within a product vary so the consumer can purchase a value brand or a luxury brand e.g. Finest range • Poverty restricts food choice. • Eating out and the consumption of takeaway food have dramatically increased. A variety catering establishments exist for every budget and palate. More disposable income is available to spend on food. • More women work full and part time and have less time to spend preparing meals; choice of convenience foods continues to rise. • More single person household exist so increasingly single portion foods can be purchased e.g. half loaves of bread. 		<p>and some subject specific terminology will be used, although not always used appropriately. There will be errors of grammar, punctuation and spelling.</p> <p>Level 1 1-6 marks</p> <p>The candidate demonstrates superficial knowledge of how social change and/or concerns about health have affected the food industry. 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.</p> <p>0=no response worthy of credit</p>

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4	<ul style="list-style-type: none"> • More people travel greater distances to work, food products reflect the more flexible lifestyle e.g. snack foods, 'deskfast' products. • Cooking is a leisure activity for many people and ingredients, equipment and recipes and new ideas are widely available. Celebrities on TV use products a demand is created. • The influence of the media and role models within popular culture influence our choices as we aspire to their lifestyles. • The increase in travel and the opportunities to try foods from different cultures have widened the choices available in shops for everyone. • Migration has ensured people bring their food tastes and style of cooking into the community. Demand for these products increase and retailers meet this demand. <p>Credit will be given for all valid points.</p> <p>Explain the nutritional value, choice and use of cereals and pulses in food preparation and cooking.</p> <p>Cereals are cultivated grasses, where the grains are used as a food source.</p> <p>Nutritional value of cereals.</p> <ul style="list-style-type: none"> • Cereals and cereal products provide energy, carbohydrate and protein. • Proteins in cereals are low in the essential amino acid lysine. • Cereals contain fat, and within the fat is the fat-soluble vitamin E. • Cereals contain substantial amounts of the B group vitamins, sodium, magnesium and zinc. • Some cereal products are fortified and contain significant amounts of calcium and iron. • Fibre could be available depending on milling process. 		<p>Level 4 19-25 marks</p> <p>The candidate demonstrates an accurate knowledge and makes a judgement on the nutritional value, choice and use of cereals and pulses in food preparation and cooking. The explanation 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.</p> <p>Level 3 13-18 marks</p> <p>The candidate demonstrates a good knowledge of the nutritional value, choice and use of cereals and pulses in food preparation and cooking. The explanation will show understanding. The information will be presented clearly and</p>

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	<p>Choice/Use of cereals</p> <ul style="list-style-type: none"> • Cereals are relatively cheap to produce, and are a cheap source of energy. • Cereals are processed and used to produce a range of products such as flour, breakfast cereals, bread and pasta. • Cereals have a very long shelf life. • Barley is mainly sold as pearl barley, which is the whole grain with its husk removed. • Maize is the main constituent in the popular breakfast cereal, corn flakes. Maize is eaten as sweetcorn and corn on the cob and used as cornflour. • Oats are richer in fats and minerals than other cereals and contain a high level of protein. Coarse, medium and fine grades of oatmeal have a variety of uses. • Pasta is made with a special type of wheat flour called durum wheat flour. • Pasta provides mainly carbohydrates in the form of starch and is low in protein and fat. Pasta contains some B vitamins and minerals. • Rye is made into rye flour. It is used to make bread and crisp breads such as Ryvita. Rye flour and bread contain very little gluten, so the bread produced is darker in colour and has a lower protein content. • Rice contains the lowest amounts of protein, fat and minerals of all cereals. When rice is harvested the grains of rice are milled. • Wheat consists of three layers. The bran accounts for 13 per cent of the grain and is a tough outer skin that contains most of the dietary fibre and minerals such as iron, calcium and phosphorus. The germ, which is the seed part of the grain, accounts for 2 per cent of the grain and contains most of the fat, protein and B vitamins. The scutellum is rich in thiamine. The largest part of the wheat grain is the endosperm, which 		<p>some subject specific terminology will be used. There may be occasional errors of grammar; punctuation and spelling are able to explain satisfactorily.</p> <p>Level 2 7-12 marks</p> <p>The candidate demonstrates some knowledge of the nutritional value, choice and use of cereals and/or pulses in food preparation and cooking. The explanation 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.</p> <p>Level 1 1-6 marks</p> <p>The candidate demonstrates superficial knowledge of how the nutritional value and/or choice and use of cereals and/or pulses in food preparation and cooking. 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.</p> <p>To access marks in Level 3 and Level 4 <u>both</u> cereals and pulses must be explained.</p> <p>0=no response worthy of credit</p>

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	<p>accounts for 85 per cent of the grain. It is the starchy part consisting of mainly carbohydrate and protein.</p> <ul style="list-style-type: none"> • Cous cous and cracked wheat (bulgur) is also made from wheat. Wheat can be fermented to make beer. <p>Pulses are the seeds of plants. Peas, beans and lentils all belong to this family.</p> <p>Nutritional value of pulses</p> <ul style="list-style-type: none"> • Pulses are a source of low biological value protein the exception to this is the soya bean, which is of a high biological value. • Pulses are a useful source of fibre and carbohydrate and are low fat. • Different pulses contain different amounts of minerals: <ul style="list-style-type: none"> - soya beans and chick peas are a rich source of calcium - green lentils, soya beans and red kidney beans are a rich source of iron - aduki beans, soya beans and green lentils are a rich source of zinc. - Phytic acid and tannins in pulses reduce the availability of minerals. • Pulses also contain a number of vitamins, namely vitamin E, riboflavin, thiamine and niacin. <p>Choice/Use of pulses</p> <ul style="list-style-type: none"> • A wide variety of pulses are available in fresh, frozen, canned or dried form - aduki beans, black eyed beans, borlotti beans, broad beans, chick peas, lentils, red kidney beans, soya beans. • Aduki beans, black eyed beans and borlotti beans can be used in stews and casseroles. • Broad beans are used as a vegetable accompaniment to a main meal. • Chick peas are the main ingredient in hummus. 		

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	<ul style="list-style-type: none">• Lentils are used in soups, bakes, cutlets and loaves.• Red kidney beans are used in chilli con carne.• Soya beans are used in the production of textured vegetable protein and other soya products.• Split peas are often added to soups to provide extra protein. <p>Credit will be given for all valid points.</p>		

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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Head office
Telephone: 01223 552552
Facsimile: 01223 552553

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