



Rewarding Learning

**ADVANCED
General Certificate of Education
2012**

Health and Social Care

Assessment Unit A2 15

assessing

Unit 15: Human Nutrition and Dietetics

[A6H71]

THURSDAY 14 JUNE, MORNING

**MARK
SCHEME**

- 1 (a) Complete the table below to include two functions and one source for each of the minerals. (AO1)

Answer may address one of the following points:

Fluorine – **Function**

- involved in the formation of bones and teeth/maintain bone structure
- helps to make teeth resistant to tooth decay
- sources** – fluoride toothpaste, drinking water and seafood, breast and milk formula, dairy products, tea, fluoride mouthwash, gelatin.

Zinc – **Function**

- needed for enzyme function and wound healing
- needed for normal growth and development
- healthy immune system
- sources** – milk, cheese, yogurt and wholegrain cereals, meat, liver.

Magnesium – **Function**

- involved in bone mineralisation
- transmission of nerve impulses
- needed for activity of some enzymes
- sources** – whole grain cereals, bread, meat, potatoes, fruits and vegetables and milk, fish, oysters, nuts, scallops, pumpkin seeds, squash, soya milk.

[1] For each function identified

[1] For each source identified

[0] is awarded for a response not worthy of credit

(9 × [1])

[9]

- (b) Explain the importance of the following vitamins in the diet. (AO1, AO2)

Answers may address some of the following:

Vitamin A – this is important to the body because retinol is required for good night vision and healthy skin and tissue. Beta carotene is an antioxidant and may help the body to defend against cancer.

[1] For use of key words/phrase(s), [2] for explanation

Vitamin C – this vitamin is important because it maintains the body's connective tissue and is vital for wound healing. It also aids the absorption of iron and has antioxidant properties.

[1] For use of key words/phrase(s), [2] for explanation

(2 × [2])

[4]

(c) Write down three functions of water in the human body. (AO1)

Answers may address some of the following points:

- carries nutrients, oxygen and carbon dioxide round the body
- water helps to regulate body temperature, for example, when we sweat water evaporates from the skin and cools us
- water helps to excrete waste products from the body
- hydrates body and aids digestion
- necessary for body processes, the body processes need water for them to take place, e.g. digestion
- acts as a lubricant
- prevents constipation.

All other valid points will be given credit

[0] is awarded for a response not worthy of credit

(3 × [1])

[3]

(d) Explain how each of the following factors may influence Ray's energy requirements. (AO1, AO2)

Answers may address the following:

age – adolescents have a high energy requirement because they are growing rapidly and Ray is also very active, therefore has a high nutritional need for energy packed foods

gender – males tend to need more energy from food as they are usually bigger and have more muscle tissue than women.

physical activity levels – in addition to Ray requiring energy for his basic bodily energy needs his level of physical activity will require more energy for his muscles to work when swimming and working out at the gym. Ray will require more energy than an adolescent who does not take regular exercise

[1] for key phrase(s), [2] explanation

(3 × [2])

[6]

- (e) Analyse how following The Eatwell Plate meets the nutritional needs of adolescents. (AO1, AO2, AO3, AO4)

Answers may address some of the following points:

- there should be a balance of foods from each of the five commonly accepted food groups below
- balance can be achieved over several days or a week, not essential for each meal.

Bread, other cereals and potatoes

- teenagers have increased energy requirements, this can be found in carbohydrates
- follow a healthy balanced diet with foods from each of the sections from The Eatwell Plate that will provide all of the following nutrients recommended to base your meals on starchy foods as these should make up a third of what we eat
- starchy foods also contain fibre, calcium, iron and B vitamins.

Milk and dairy foods

- calcium sources need to feature at all meals during the day for teenagers to ensure optimum bone health in later years. Sources of calcium suggested in The Eatwell Plate – milk, cheese, yogurt, white bread, green leafy vegetables, nuts, seeds, dried fruit and oranges
- phosphorus and magnesium to give strength and harden bones
- vitamin D – to assist with the absorption of calcium. Sources in the diet include margarine, oily fish and liver.

Meat, fish and alternatives

- protein requirements for growth and repair and bone development. Excess protein is converted into glucose in the liver and used as a source of energy
- thiamin for the release of energy from nutrients in every cell in the body.

Fruit and vegetables

- riboflavin – needed for healthy skin. Helps release energy to cells in the body's use of carbohydrates
- niacin – assists in the nervous system and healthy skin. Involved in the energy producing reactions in the body cells
- vitamin A – good for night vision and healthy skin and tissue
- vitamin C – essential factor for the synthesis of collagen that forms part of the structural framework for bones, therefore maintaining the body's connective tissue. Important for wound healing. Helps iron absorption and has antioxidant properties. Sources fruit and vegetables – The Eatwell Plate recommends that individuals take foods from this section to help meet their 5–7 portions of fruit and vegetables a day
- potassium – this helps control the balance of fluids in the body and also is essential for muscle and liver function which are important for the teenagers

- omega 3 – fish oils – eat more fish recommendations suggest we should aim to eat at least two portions of fish a week. This would meet the nutritional needs of the correct types of fat for the diet of a teenager. Oily fish are rich in omega 3 fatty acids which are known to keep the heart healthy.

Foods containing fat and sugar

- these must be reduced to a minimum in the diet due to the risk of obesity, dental caries, coronary heart disease.

All other valid points will be given credit

This list is not exhaustive and candidates may use examples other than those identified above – these may be accepted if they are relevant.

[0] is awarded for a response not worthy of credit [15]

Level 1 ([1]–[4])

Overall impression: basic knowledge and understanding

- displays limited knowledge of how The Eatwell Plate meets the nutritional needs of adolescents
- limited analysis
- quality of written communication is basic. The candidate makes a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([5]–[8])

Overall impression: adequate knowledge and understanding

- displays adequate knowledge of how The Eatwell Plate meets the nutritional needs of adolescents
- adequate analysis
- quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

Level 3 ([9]–[12])

Overall impression: competent knowledge and understanding.

- displays a good knowledge of how The Eatwell Plate meets the nutritional needs of adolescents
- competent analysis of at least four aspects achieves at top of band
- quality of written communication is competent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard to make meaning clear.

Level 4 ([13]–[15])

Overall impression: highly competent knowledge and understanding.

- displays an excellent knowledge of how The Eatwell Plate meets the nutritional needs of adolescents addressing all aspects
- quality of written communication is excellent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is extremely well organised with a highest degree of clarity and coherence. There is extensive use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of the highest standard and ensure that meaning is absolutely clear.

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- 2 (a) Using the information in the table above discuss the long-term effects on Tom's health of his current imbalance of protein and calcium. (AO1, AO2, AO3, AO4)

- protein intake – Tom's intake is less than the recommended intake for his age. If this was to continue Tom may become deficient and growth and repair of body tissue would fail and he would be lacking in energy. In extreme cases Tom could suffer from Kwashiorkor
- calcium intake – Tom's intake is lower than what is recommended for his age therefore he could become deficient and result in stunted growth and rickets. Brittle bone disease/osteoporosis/osteomalacia in later life.

[1] For use of key words/phrase(s), [2] awarded for adequate discussion of how Tom's health will be affected, [3] for full discussion relating to how Tom's health can be affected.

(2 × [3])

[6]

- (b) Explain why Cheryl has been advised to combine these two nutrients. (AO1, AO2)

Answers may include the following:

- vitamin D assists in the absorption of calcium – the uptake of calcium and phosphorus by bones and teeth.

[1] For use of key phrase(s), [2] for fuller explanation using key terms

(1 × [2])

[2]

(c) Explain two functions of NSP. (AO1, AO2)

- helps the digestive system to function
- may prevent various bowel disorders including constipation, diverticular disease, bowel cancer, appendicitis and haemorrhoids
- can help people to control their body weight because high fibre foods are filling
- maintain energy balance and reduce obesity
- slows down rate of glucose absorption
- may reduce serum cholesterol concentration.

[1] key phrase(s), [2] for explanation

(2 × [2])

[4]

(d) Discuss how the following factors may influence Cheryl's food choice when doing her weekly shopping for the family. (AO1, AO2, AO3, AO4)

Answers may address some of the following points:

Advertising

- health claims, i.e. omega 3, 6 for brain development
- low in sugar, oral health
- low salt
- low saturated fat weight control
- appealing to children in colour packaging
- role models of footballers, celebrities, i.e. David Beckham, Cheryl Cole
- promotions – buy one get one half price
- special offers
- organic
- no additives, i.e. e-numbers
- child branding, e.g. Disney characters, tweenies shaped pasta, dairylea dunk pots with vegetables
- child appeal, e.g. cereals, chicken dippers, potato shapes, frubes, Billy bear ham.

Economic

- cost of food will be a primary determinant of food choice
- Cheryl's disposable income into the family will influence the food she will buy
- if Cheryl's income is limited she will have a greater tendency to choose lower nutrient foods
- less fruit and vegetables will be chosen as these are expensive
- low income will influence where Cheryl shops due to accessibility and therefore choice and range of food will be restricted
- healthy food tends to be more expensive when available within towns and cities compared to supermarkets on the outskirts of towns
- cheaper cuts of meat may result in a diet higher unsaturated fat
- high income may result in organic food being chosen as Cheryl will be able to afford these
- family will most likely follow a healthy well-balanced diet if income is not restricted
- on-line shopping for offers, saves transport costs.

Knowledge

- will need to know how to manage Liam's coeliac disease and avoid gluten free foods
- Cheryl's level of knowledge about nutrition will influence type of food, e.g. foods rich in protein and carbohydrates
- level of education into eating habits, e.g. not buying sugary snacks
- knowing the likes and dislikes of the family will influence Cheryl's choice as she will mainly choose those foods her family are most likely to eat
- will read and understand the information in labelling, e.g. organic
- awareness of terms such as genetically modified foods therefore less likely to choose
- will understand and have a knowledge about the role certain foods play in reducing risk if certain diseases, e.g. NSP and intestinal tract, fruit and vegetables and their antioxidant properties. Saturated fat and their role in coronary heart disease
- will understand and be aware of research into fish oils.

All other valid points will be given credit

This list is not exhaustive and candidates may state other points than those identified above – these may be accepted if they are relevant and valid.

[1] For use of key phrase(s), [2] for adequate discussion, [3] for fuller discussion

(3 × [3])

[9]

- (e) Analyse the dietary advice that these sources may offer. (AO1, AO2, AO3, AO4)

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Answers may address some of the following points:

- sources could suggest a diet high in monounsaturated fatty acids and low in saturated fats may protect against coronary heart disease, e.g. oleic acid from olive oil. Mediterranean diets show lower rates of developing coronary heart disease, e.g. a large intake of fruit and vegetables
- advice may state that substitution of saturated fats by MUFA's result in a reduction of LDL cholesterol
- Cheryl's father should increase polyunsaturated fats and n-3, e.g. increase intake of fish (oily)
- advice to reduce salt intake, as a high sodium intake is a known cause of hypertension which is a risk factor of coronary heart disease. Older people lose their sense of taste so the amount of salt they add to food may increase
- low fat dairy products, nuts, fruit and vegetables are known to help reduce high blood pressure
- eat more foods containing potassium, e.g. fruits, i.e. bananas and vegetables
- calcium is associated with a low risk of developing coronary heart disease as it binds dietary fats and stops their absorption therefore Cheryl's father should ensure his diet is rich in calcium foods but not solely from dairy sources as these can be high in fat
- moderate alcohol intake (within safe limits) anti-oxidants in red wine
- NSP – Cheryl's father should increase his intake, e.g. oats have been shown to reduce serum cholesterol levels, e.g. cereals, beans, nuts, fruit, vegetables, seeds
- vitamin E, e.g. vegetable oil, sunflower seeds, oil, etc. Anti-oxidant nutrients can lower the risk of developing coronary heart disease
- fresh fruit and vegetables and starchy foods can be used in snacks, another method of reducing fat content in diet
- Cheryl's father could be encouraged to consume the products that claim to lower cholesterol, e.g. benecol.

This list is not exhaustive and candidates may analyse other than those identified above – these may be accepted if they are relevant and valid

[0] is awarded for a response not worthy of credit

[12]

Level 1 ([1]–[3])

Overall impression: basic understanding

- displays limited knowledge of the advice that may be given to reduce the risk of coronary heart disease
- limited analysis/may list several examples
- quality of written communication is basic. The candidate makes a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([4]–[6])

Overall impression: adequate knowledge and understanding

- displays adequate knowledge of the advice that may be given to reduce the risk of coronary heart disease
- adequate analysis
- quality of written communication is good. The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident.

Level 3 ([7]–[9])

Overall impression: competent knowledge and understanding

- displays a good knowledge of the advice that may be given to reduce the risk of coronary heart disease
- competent analysis
- quality of written communication is competent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard to make meaning clear.

Level 4 ([10]–[12])

Overall impression: highly competent knowledge and understanding

- displays an excellent knowledge of advice that may be given to reduce the risk of coronary heart disease
- excellent analysis
- quality of written communication is excellent. The candidate successfully selects and uses an appropriate form and style of writing. Relevant material is extremely well organised with a highest degree of clarity and coherence. There is extensive use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of the highest standard and ensure that meaning is absolutely clear.

3 (a) Explain three conditions bacteria need to grow. (AO1, AO2)

Answers may address some of the following points:

- correct temperature
- time
- food
- moisture
- favourable chemical environment
- oxygen.

[1] for key phrase(s), [2] for explanation
(3 × [2])

[6]

(b) Discuss the information that should be displayed on the wall chart.
(AO1, AO2, AO3)

Answers may address some of the following points:

- always wear a clean apron or some form of protective clothing when preparing food
- wash hands thoroughly before handling food, use hot water and liquid anti bacterial soap and dry hands thoroughly with disposable towels
- always wash hands after visiting the toilet, after handling raw food and waste food products
- dry hands with a hot air drier is an option
- never cough or sneeze during food preparation
- cover all cuts with waterproof dressing, preferably with a bright coloured blue plaster
- tie hair back before working with food, if necessary wear appropriate head coverings.
- do not work with food when suffering from diarrhoea or sickness.
- ensure nails are short and without nail polish.
- no jewellery must be worn as rings can harbour bacteria.

[0] is awarded for a response not worthy of credit

[6]

Level 1 ([1]–[2])

Overall impression: basic understanding

- displays limited knowledge of basic personal hygiene rules that exist within a kitchen environment.

Level 2 ([3]–[4])

Overall impression: adequate understanding and knowledge

- displays adequate knowledge of basic personal hygiene rules that exist within a kitchen environment.

Level 3 ([5]–[6])

Overall impression: competent knowledge and understanding

- displays a very good to excellent knowledge and understanding of the basic hygiene rules that exist within a kitchen environment.

- (c) Discuss how two different religious beliefs may influence the planning and preparation of meals at Meadowhill. (AO1, AO2, AO3, AO4)

Jewish

- meat served must be prepared under strict Jewish Laws. It must be Kosher which means it:
 - must not serve pigs, birds of prey, eels, fish without scales and shellfish
 - meat must not be cooked with or eaten with the same meal as dairy products
 - cheese must be made with vegetable rennet not animal
 - meat must not be cooked in butter
 - separate cooking equipment must be used for milk and meat
- religious festivals will have to be taken into consideration and fasting days, e.g. Day of Atonement for Jews, in that individuals eat before sun sets and then a 24 hour fast begins.

Muslim

- food must be Halal (lawful) which means animals are slaughtered according to Muslim law. All food must be prepared without scales
- forbidden food includes meat incorrectly slaughtered, pork and alcohol is forbidden also
- the staff must ensure that no alcohol is used in the cooking process of sauces when preparing food. A special butcher should be used to ensure all food is slaughtered appropriately
- Ramadan is the ninth month of the Muslim calendar and lasts for a month during this time. Muslims do not eat or drink from dawn to sunset. The care home will have to consider this when planning and preparing food.

Hindu

- meat served must not be from a cow as it is a sacred animal. Food preparation equipment must also not come into contact with meat from a cow
- other meats are permitted for those non-vegetarian Hindus although many are vegetarian.

Rastafarian

- most will only eat 'I-tal' foods, i.e. foods which are considered to be in the natural or whole state. The care home will have to respect this
- also many Rastafarians are vegetarian, so a wide range of fruit, vegetables, quorn alternatives, peas, beans, lentils could be a healthy substitute at meals times.

Christian

- the Christian religion does not forbid eating any foods, but some denominations have traditions that fish is eaten on Fridays rather than meat. There may also be fasting days that the staff of the care home may need to be made aware of. Christian festival such as Easter (simnel cake, hot cross buns, roast pork), Christmas (turkey, mince pies).

Buddhist

- many Buddhists are vegetarians as their religion preaches against killing. However, eating meat is not actually forbidden and they can eat fish also
- many religious beliefs prefer to follow vegetarian or vegan diets. The canteen should ensure they have a range of vegetarian options and liquid alternatives also for those residents who may be fasting. Meals can still be nutritious and meet the needs of the residents.

All other valid points will be given credit

This list is not exhaustive and candidates may use examples other than those identified above – these may be accepted if they are relevant and valid.

[1] for key phrase(s), [2] for adequate discussion, [3] for fuller discussion
(2 × [3]) [6]

(d) Analyse how the HACCP system aims to ensure the safe storage, preparation and handling of food. (AO1, AO2, AO3, AO4)

- a flow chart is produced which shows all the steps or processes in the operation, this will be at every stage, e.g. storage defrosting preparation and handling of food
- if the fridge, freezer store cupboard is not correct temperature then bacteria will thrive
- the hazards will be identified throughout the three areas and also assessed. A hazard is anything that may cause harm to the consumer. It may be micro biological, e.g. presence of toxic cleaning agents or physical, e.g. the presence of foreign bodies. This could be when the food is stored incorrectly or handled without wearing protective gloves. This means the catering staff must be aware of and know the facts about bacteria and how it thrives so these risks can be minimised, e.g. time, moisture, etc.
- if insufficient time is given to defrosting bacteria will survive cooking, this is a hazard
- cross contamination is another hazard that needs to be identified
- the next stage is identifying the critical control point. This has to be carried out correctly to make sure the hazard is removed or at least reduced to a safe level. An example of this is the defrosting of frozen chickens, this is a step which if carried out incorrectly could allow salmonella present to multiply, defrosting is therefore a critical control point that catering staff must be aware of
- cooking is a critical control point

- slicing and preparing cooked food to be consumed is a critical control point, therefore it must be ensured all equipment is clean when slicing, avoid touching with bare hands, etc.
- hot holding of food is a critical control point, therefore care needs to be taken it is not in the danger zone and above 65+ for no more than two hours
- the next stage is specifying control procedures. This involves establishing safe food handling routines at the CCPs (critical control points) an example of this would be when preparing food, the time and temperature it is cooked at or how long the food is in the danger zone
- the final stage is the monitoring control procedures. Unless these are implemented and monitored the HACCP system will not be effective or work. Therefore, it is important that temperature checks on food are carried out, recorded and continuously monitored, e.g. in freezer storage or when food is being cooked. Before and after cooking is important too. An example of checking cooked food would be to visually observe, if in the case of meat and poultry the juices run clear this will indicate if the food is cooked properly. Visual checks by staff of cleanliness of equipment, ingredients and the use by date should all be monitored in the storage preparation and handling of food.

All other valid points will be given credit

This list is not exhaustive and candidates may use examples other than those identified above – these may be accepted if they are relevant and valid.

[0] is awarded for a response not worthy of credit

[12]

Level 1 ([1]–[3])

Overall impression: basic understanding

- displays a limited knowledge of the HACCP system and how it is applied to storage preparation and handling of food
- there is little or no evidence of analytical writing
- quality of written communication is basic. The candidate makes only a limited attempt to select and use an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([4]–[6])

Overall impression: adequate knowledge and understanding.

- displays adequate knowledge of the HACCP system and how it is applied to storage preparation and handling of food
- there is adequate analysis
- quality of written communication is adequate. The candidate makes a reasonable attempt to select and use an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning evident
- candidates who do not refer to the stages of HACCP cannot achieve beyond this band.

Level 3 ([7]–[9])

Overall impression: competent knowledge and understanding.

- displays good knowledge of the HACCP system and how it is applied to storage preparation and handling of food
- there is competent analysis
- quality of written communication is competent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure that the meaning is clear.

Level 4 ([10]–[12])

Overall impression: highly competent knowledge and understanding

- displays excellent knowledge of the HACCP system and how it is applied to storage preparation and handling of food
- there is in depth analysis
- quality of written communication is excellent. The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is extremely well organised with the highest degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a high standard and ensure that meaning is absolutely clear.

Total

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30

100