GCE

Rewarding Learning

CCEA GCE AS
Exemplifying Examination Performance

Nutrition and Food Science

This is an exemplification of candidates' performance in GCE AS examinations (Summer 2017) to support the teaching and learning of the Nutrition and Food Science specification.

Updated: 3 May 2018

EXEMPLIFYING EXAMINATION PERFORMANCE

GCE Nutrition and Food Science

Introduction

These materials illustrate aspects of performance from the 2017 summer AS examination series of CCEA's revised GCE Specification in 2016.

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

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

For further details of our support package, please visit our website at www.ccea.org.uk

Best wishes

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GCE: AS Nutrition and Food Science

AS1: Principles of Nutrition

Grade: A Exemplar

Section A

Answer all questions in the spaces provided.

Q1a(i) Circle a food below which is an example of a low biological value protein. [1]

rice **cheese** **eggs** **fish**

Examiner's comments

The candidate correctly identified rice as an example of a low biological value protein.

1 mark awarded

Q1a(ii) Suggest **two** foods that could be eaten, as part of a meal, to illustrate protein complementation. [1]

Student's response

baked beans and toast

Examiner's comments

Two foods of low biological value have been accurately identified.

1 mark awarded

Q1b Explain the importance of protein quality when planning meals for young children. [2]

Student's response

It is vital that children are provided with high biological value foods so that they have sufficient in – despensible amino acids for growth and repair of cells.

Examiner's comments

Competent explanation demonstrating a clear understanding of protein quality. Effective use of terminology such as "indispensable amino acids" and "high biological value". Candidate also remained focused on young children by addressing importance of "growth and repair of cells" at this lifestage.

2 marks awarded

Q1c What is the effect of illness on nitrogen balance in relation to protein requirements? [2]

Student's response

During illness negative nitrogen balance will take place. This is due to body being unable to break down nitrogen and absorbing it, this can lead to muscle loss. Protein requirements need to be increased to reduce weight and muscle loss.

Examiner's comments

Rather than simply describing nitrogen balance, the candidate has successfully focused on the effect of illness on nitrogen balance while also addressing the issue of protein requirements.

2 marks awarded

Q1d Using the table below compare the nutritional value of Quorn and beef and explain the significance for health. [5]

Food	Energy kcal/ 100g	Total Fat (g/100g)	Saturated fat (g/100g)	Cholesterol (mg/100g)	%Energy from Total Fat	Fibre (g/100g)
Quorn mince (frozen)	94	2	0.5	0	19	6.0
Beef mince (raw)	225	16.2	6.9	60	65	0

Source: adapted from www.mycoprotein.org.

Student's response

Quorn has 2g fat per 100g whereas beef is much higher, 16.2g fat per l00g. When eaten excessively, this can have health implications such as leading to overweight, obesity, CHD and cancers. Beef has 6.9g of saturated fat (compared to 0.5g in Quorn). Saturated increases total and LDL cholestrol. Beef has 60g of cholestrol whereas Quorn has 0mg. Cholestrol increases the bodys risk of a cardiac arrest by blocking the coronary arteries of the heart, or stroke when blockage is in the brain.

Beef has a much higher energy density, useful for those with a small appetite such as the elderly or athletes. Lastly, Quorn is a greater source of fibre, when in its insoluble form prevents constipation.

Examiner's comments

This was a highly competent use of data. The candidate quoted figures from the table to support their explanations relating to health. Each nutritional point was addressed and a good range of health issues were explained throughout the response. The candidate also clearly compared using terms such as 'whereas' and 'compared to'.

5 marks awarded

Q2a(i) Explain the term glycaemic loading in relation to carbohydrate absorption. [4]

Student's response

Glycaemic loading takes into consideration the glycaemic index of the food and the grams of carbohydrate present in the food. It uses a ranking system: 0-10 have a low GI load, 11-19, medium GI load, 20-30 high GI load. It is calculated as GI × grams of carb divided by 100.

Examiner's comments

Candidate demonstrated a precise knowledge of glycaemic loading in relation to carbohydrate absorption. There was a clear distinction between glycaemic index and glycaemic loading. The response included some elaboration, fulfilling the requirements of the command word, 'explain', in this question.

4 marks awarded

Q2a(ii) Assess the effects on health of consuming foods with a different glycaemic index, such as those in the table below. [5]

Food	Glycaemic Index per average portion
White plain baguette	95
Whole wheat bread	71
Cornflakes	93
All Bran	55
White rice	89
Brown rice	50
Apple	39
Ripe banana	62
Grapefruit	25

Student's response

High GI foods such as a white plain baguette, increase the glycaemic response which causes an initial rise in blood sugar levels and a subsequent decrease. This sugar function can increase risk of Type 2 diabetes. Low blood sugar levels can also cause a drop in mood by feeling lethargic or tiredness. Whereas low GI foods such as Grapefruit maintain blood sugar levels, suppressing appetite and increasing satiation period after consumption of a meal.

Examiner's comments

This highly competent response demonstrated good detailed knowledge and understanding of the effects on health when consuming foods of a different glycaemic index. Candidate selected appropriate and relevant examples from the table, to support their assessment.

5 marks awarded

Q2b Identify two possible problems that could occur if too much fibre is consumed. [2]

Student's response

Trapped wind (flatulence) and fibre can bind and trap nutrients preventing their absorption, making them unavailable.

Examiner's comments

Two distinctly different problems were accurately identified.

2 marks awarded

Q2c State **two** food sources of intrinsic sugars. [2]

Student's response

(i) *Apples* **(ii)** *Carrots*

Examiner's comments

Two different food sources were stated accurately.

2 marks awarded

Q2d Using the table below justify the decision to choose a banana rather than a chocolate bar as the preferred source of energy. [5]

Food	Portion size	Energy (kcal)	Sugar (g)
Banana	100g	81	18
Chocolate bar	45g	234	25

Student's response

Bananas have a higher portion size than a chocolate bar, increasing satiety levels. They also have much less sugar (18g compared to 25g). Bananas have intrinisic sugars, sugars naturally present in cellular wall which do not have health implications. Whereas, a chocolate bar contains free sugars (initially Non Milk Extrinsic Sugar) which are thought to lead to dental erosion and dental caries by bacterial acid building on plaque of teeth. Bananas have a lower energy density and sugar levels reducing glycaemic response, preventing sugar fluctuations which may lead to mood swings. This prevent Type 2 diabetes risk.

Examiner's comments

This was a highly competent justification of the decision to choose a banana rather than a chocolate bar. The candidate was very focused on the data in the table and addressed all the main headings within the response. The quality of written communication was excellent and the response included appropriate subject specific terminology.

5 marks awarded

Q3a Discuss the effects of a deficiency of vitamin B_1. [3]

Student's response

A deficiency in vitamin B_1, can reduce growth in children. It can also cause the disease beriberi which is characterised by symptoms including odema, excessive fatigue and severe muscle wastage.

Examiner's comments

A good range of effects associated with Beri Beri were discussed in this response. Good specific knowledge and understanding was evident throughout.

3 marks awarded

Q3b Explain the role of potassium in the body. [3]

Student's response

Potassium helps to lower blood pressure by encouraging the removal of sodium from the body. It is also needed to maintain electrolyte and fluid balance. Finally, potassium contributes to the nervous system development.

Examiner's comments

A highly competent explanation of the role of potassium in the body. Candidate was clear and accurate in this response.

3 marks awarded

Q3c Name **three** factors that enhance the absorption of calcium. [3]

Student's response

- *Vitamin D availability*
- *An acidic environment of the intestines*
- *Lactose foods (calcium is more easily absorbed)*

Examiner's comments

Three different factors were named correctly

3 marks awarded

Q3d Propose and justify the nutritional advice you would give to a pregnant woman in relation to vitamins. [5]

Student's response

Vitamin D supplementation is advised if the women was housebond or does not eat enough vitamin D rich foods (commonly vegetarians or vegans). Do not take vitamin A supplementation or eat liver (high vitamin A content) as this could lead to birth defects for the child as it can be poisonous. Vitamin C foods such as oranges and green leafy vegetables are encouraged to promote the absorbtion of iron for the development of iron stores of the foetus.

Examiner's comments

Candidate proposed valid nutritional advice in relation to vitamins. Each piece of advice contained a clear accurate justification in relation to needs during pregnancy. A well-focused highly competent response.

5 marks awarded

Q4a Discuss the importance of achieving an adequate energy intake for a frail elderly person during an acute illness. [4]

Student's response

Adequate energy intakes are important to a frail elderly person during acute illness to aid recovery and prevent further deterioration of health. Adequate energy also benefits mental wellbeing, making an individual feel 'prepared' for battling their illness. Energy is also important to aid mobility, important to a frail elderly person, to reduce the risk of falls, strains and further injury.

Examiner's comments

This was a very focused response which applied relevant and appropriate knowledge to the question. The candidate presented a good range of mature relevant points and these were clearly discussed.

4 marks awarded

Q4b Explain why a supplement of vitamin K is usually given to a newborn infant. [2]

Student's response

Vitamin K aids in blood clotting synthesising prothronitin and fibrinogen, preventing prolonged clotting times which may lead to death. Newborn infants are unable to synthesise bacteria vitamin K, thus they benefit from injection.

Examiner's comments

Two key pieces of information were essential in this question. Firstly, why a newborn needs a supplement and secondly what it does in the body of a newborn. Good precise knowledge was evident in this response.

2 marks awarded

Q4c State **two** reasons why children might be at risk of developing rickets. [2]

Student's response

If a childs diet doesn't provide adequate vitamin D a or if they don't get enough sun exposure to synthesise vitamin D.

Examiner's comments

Two separate reasons have been clearly and concisely stated.

2 marks awarded

Q5 Discuss the role of essential fatty acids in the diet. [5]

Student's response

Essential fatty acids are needed to maintain cell membranes. They produce hormone like substances which help regulate cholesterol in blood reducing risk of heart attacks by reducing tendency of blood to clot which leads to death. They also carry functions internally such as nerve and immune system development, improves metabolism and is needed for muscle contraction. Two types of PUFA's Omega 3 and 6. Omega 3 found in green veg & oily fish reduces tendency of blood to clot. Omega 6 in Sunflower oil reduces LDL cholesterol in the body.

Examiner's comments

This was a highly competent discussion of the role of essential fatty acids in the diet. The candidate demonstrates the ability to discuss each role, rather than just listing points. A high level of knowledge and understanding is evident from this response.

5 marks awarded

Section B

Quality of written communication is assessed in this section.

Answer **two** out of three questions from this section.

Write your answers in the Answer Booklet provided.

Q6 Explain how Dietary Reference Values (DRVs) and Estimated Average Requirements (EARs) should be used to evaluate diets. [12]

Student's response

Dietary Reference Values (DRVS) and Estimated Average Requirements (EARS) should be used to evaluate diets long term and not on specific foods. EARs are used for healthy individuals who do not have a deficiency in a particular nutrient. 50% of the population will need more of a nutrient and 50% of the population will need less. They should be used as a population and not individually due to the wide comparison of physical activity levels and energy expenditures. DRVS are set by the Scientific Advisory Commitee on Nutrition, and they publish results of nutrients of most concern, e.g iron, folate and zinc. They are used by policy makers and healthcare professionals to suit the DRV values for a specific patient with particular needs. The DRV and EARs are used for Public Health and individuals see this through food labelling, made mandatory by The European Food Safety Authority. They produce information per 100g of particular nutrients such as proteins, fats and sugars. Consumers should not take these statistics as nutritional advice, but information to compare the foods for them to achieve a healthier and more improved diet. By doing so, this can easily show consumers what is benefictial and what is not benefictial in their overall diet.

Many of these EARs and DRVS can be used in healthcare. For example an individual who is close to the reference nutrient intake, is receiving nutrients required and is not in danger of having a deficiency. Those individuals who have a high requirement for nutrients but are closer to the Lower reference value intake (LRNI – for individuals with lower nutrient requirements) are at risk of developing deficiencies which can have a negative effect on health.

Healthcare can also help groups of people within a care setting such as nursing homes, hospitals and schools. They can set a dietary plan for individuals with particular needs e.g anaemia or at risk of a weak immune system. These plans are taking from the EARs and DRVs set and so, this helps to evaluate diets of individuals.

DRVs and EARs are common to be seen in misapplicated ways. It is important to recognise from these targets set that we are receiving lots of nutrition from our diet and they can help us reach a stage that does not leave us in a situation where we suffer symptoms of excess or deficiency.

Examiner's comments

This response demonstrated very clear knowledge and understanding of Dietary Reference Values and Estimated Average Requirements. The candidate did not just describe the values and what they mean, but rather clearly *explained* how these values should be used to evaluate diets. Appropriate examples were quoted to support and provide elaboration for each key point. This was a succinct and well-structured response and exemplifies a highly competent quality of written communication.

12 marks awarded

Q7 Consider the nutritional benefits derived from consuming a range of fluids, other than water. [12]

Student's response

Other sources of fluids, other than water include tea and coffee, milk, smoothies and fruit juice and milkshakes.

Teas and coffees are goods sources of water and can also have many nutritional benefits. Teas contain a chemical that helps prevents cardiovascular diseases and can also reduce blood pressure. Green teas especially are known to be rich in antioxidants and can also promote weight loss. Teas and coffees with added milk therefore can also provide calcium to promote healthy bones and teeth. Despite having caffiene, teas and coffees have a low amount of caffeine which therefor has no dehydrating affect. Children are told not to drink coffee due to the caffeine content and are encouraged to drink weak or decaffienated tea with milk and no sugar.

Milk is also another source of fluids. Milk also helps provide calcium, vitamin D and protein. It is advised for children to consume full fat milk at first and then gradually by the age of 5-6 be encouraged to drink semi-skimmed milk. Semi-skimmed milk still has all the nutritional value of full fat milk; but less fat and energy. Using milk as a source of fluid can therefore help develop strong bones and teeth and hopefully achieve peak bone mass.

Smoothies and fruit juices contain a lot of fluid while also containing vitamins and fibre. Fruit juices and smoothies have fruit extract which contains vitamins such as vitamin A and vitamin C. These have antioxidant properties which help protect lipids and reduce the risk of cancer and coronary heart disease. Smoothies made from full fruit also contain a lot of fibre, which can aid digestion and make us feel fuller for longer to prevent snacking on excess calories thus preventing weight gain.

Milkshakes are also a sources of calcium and fluid. The calcium and protein in milkshakes can help improve bones and teeth. However due to the high levels of sugar, milkshakes can also contain a lot of energy which may lead to weight gain.

Whole fruit and vegetables is also a good source of fluid. In addition, these sources provide a number of vitamins, minerals and fibre which all have a positive effect on health. These source also contain intrinsic sugars which are known to have no adverse effect on health, compared to fruit juices and milkshakes. The vitamins provides from sources such as watermelon, oranges and apples plays an antioxidant role within the body. The fibre also helps with digestion and aids us in maintaining weight as it makes us fuller for longer.

Examiner's comments

This was a very well structured response there was clear identification of a suitable fluid followed by a highly competent consideration of the nutritional *benefits* of consuming each of these in the diet. The candidate has a clear knowledge and understanding of the fluid being considered and the quality of written communication is excellent throughout the response.

12 marks awarded

Q8 Describe the specific nutritional requirements of a teenager. [12]

Student's response

Teenagers need adequate energy to provide for the large growth spurt during this cycle of the lifestage. Moreover energy intake should be increased, however this should be dependent on the adolescents physical activity level, in order to help to prevent obesity. Furthermore teenage girls gain lean mass and fat mass, as well as increasing in height and weight, meaning that they have a higher energy requirement at this stage. However boys lose fat mass and gain lean mass, increasing in height and weight, which means they require more energy than teenage girls. This is because lean mass is more metabolically active than fat mass, resulting in teenage boys having a higher BMR.

Furthermore teenagers need adequate protein in order to provide for the growth spurt. This occurs in teenage girls around the age of 12 and at around 14 for boys. Moreover due to boys being generally bigger and having more metabolically active lean tissue, they need more protein than girls. Protein sources with high bioavailability are red meat, dairy products and fish.

Additionally teenagers need adequate calcium in order to provide for bone growth due to the growth spurt. Teenagers also need calcium to build up calcium in the bone bank, in order to achieve peak bone mass by the age of 30. This is particularly important in teenage years as the most amount of calcium is absorbed and accrued at this age.

Furthermore around 90% of bone density is acquired during teenage years. Furthermore this is particularly important for teenage girls as they are more at risk of osteoporosis in later life. Moreover teenagers need adequate Vitamin D from the sunlight or food sources, such as oily fish. Vitamin D is needed during the teenage years for the proper absorption and hence the calcification of the skeleton. A deficiency of vitamin D may occur during adolescence due to inadequate sun exposure as a result of a more sedentary lifestyle, with many spending hours on electronics. Moreover there may be inadequate Vitamin D in the diet due to inadequate vegetarian or vegan diets which can result in a deficiency. Moreover teenage girls who veil their skin are also at a high risk of deficiency. Vitamin D deficiency can lead to rickets and therefore adequate amounts are important for teenagers.

Additionally requirements for iron are high during teenage years due to growth spurt and consequent increase in blood volume. Therefore adequate iron is needed to prevent iron deficiency anaemia which can cause fatigue and consequently poor academic performance and in sports. Furthermore iron has also been suggested to improve cognitive ability and hence this is important for adolescents also.

Additionally iron is important for teenage girls due to loss of red blood cells due to heavy menstruation. Therefore a supplement may be recommended to those with especially heavy periods. Furthermore a deficiency is most common in early

teenage years when the body is still adapting to monthly losses. Therefore iron is needed especially for teenage girls.

Moreover zinc is also needed by the teenager for normal growth. Additionally zinc is needed by teenage boys especially for normal sexual maturity. Therefore zinc is important during teenage years for normal development of the reproductive system as well as the immune system. Sources of zinc include red meat and nuts.

Furthermore essential fatty acids especially long chain n-3 fatty acids are needed for cognitive ability. Therefore this is important for teenagers to ensure optimum academic performance and concentration. However teenage girls shouldn't consume more than 2 portions of oily fish per week to reduce the risk of low levels of toxins, such as dioxins or PBCs, building up and are passed onto the baby in a future pregnancy.

Examiner's comments

The quality of this response is highly competent at AS level, for example, when addressing protein, the candidate goes beyond 'growth spurt' to explain the importance in development of bone and muscle and was able to make a distinction between male and female teenagers.

Similarly, the candidate recognises the importance of iron beyond preventing anaemia and addresses the need for iron for increased blood volume and possibly improved cognitive function at this life stage.

Overall the candidate presented a wide range of specific nutrients required for a teenager and provided a very focused and well-structured response to this question. The quality of written communication is of a very high standard and complex terms have been used very effectively throughout this response, which convinces the examiner of a good in-depth understanding. 12 marks could also have been achieved with a more concise response.

12 marks awarded

GCE: AS Nutrition and Food Science

AS2: Diet, Lifestyle and Health

Grade: A Exemplar

Section A

Answer **all** questions in the spaces provided.

Q1a Recommendations for energy in adults are shown in the table below:

Age	EAR – Males	EAR – Females
19–24 year olds	2272 kcal	2175 kcal
55–64 year olds	2581 kcal	2079 kcal
Over 75 year olds	2294 kcal	1840 kcal

Q1a(i) What do the letters EAR represent in relation to energy? [1]

Student's response

Estimated average requirement

Examiner's comments

EAR – Estimated Average Requirement (1 mark) this had to be exactly as stated and no half marks were awarded for partial answers.

1 mark awarded

Q1a(ii) Account for the difference in energy requirements between males and females. [2]

Student's response

This is as males are generally bigger and have a larger muscle mass than females meaning more energy is needed to fuel their body.

Examiner's comments

The candidate recognized that males were bigger and had also referred specifically to muscle mass.

2 marks awarded

Q1b List **three** factors that may affect energy balance. [3]

Student's response

Physical activity

Illness

Examiner's comments

Three factors were asked for in the question. In this case the candidate only gave two.

2 marks awarded

Q1c Comment on why energy requirements change among the three age groups. [3]

Student's response

The younger you are the higher your basal metabolic rate will be and so more energy is required. Also the younger the person the more growth will be happening and so more energy will be required. As we age activity levels tend to decrease and so energy required decreases.

Examiner's comments

The candidate made some reference to basal metabolic rate and growth. To achieve full marks body composition, muscle mass or fat could have been suggested as reasons why energy requirements change with age.

2 marks awarded

Q2a(i) Define cancer. [2]

Student's response

Cancer is when abnormal cells divide in an uncontrolled way.

Examiner's comments

An accurate definition was given which made reference to two points – abnormal cells and uncontrolled division.

2 marks awarded

Q2a(ii) Outline how cancer can develop in the body. [2]

Student's response

Cancer can develop by carcinogen eaten in food are cancer causing chemicals + damage in body cells. Damage to DNA causes cells to divide rapidly & uncontrolled leading to cancer.

Examiner's comments

The candidate was not awarded full marks because they did not focus on how the disease spreads in the body as specified in the question.

1 mark awarded

Q2b Explain how meat consumption may influence an individual's cancer risk. [4]

Student's response

Red meat has class 1 carcinogens, so red meat should be reduced from 90g – 70g a day. These carcinogens in red meat cause DNA damage which can lead to cells dividing uncontrollably = cancer. Also the cooking process of meat as frying adds carcinogen actlamyde. Also processed meats are high in salt to preserve them so increases stomach cancer risk. If you eat a lot of meat less fruit + veg are consumed which lower cancer risk. Less fruit + veg means less antioxidants which reduces free radicals.

Examiner's comments

Full marks were awarded because the candidate provided a detailed explanation focusing on how meat consumption may influence an individual's cancer risk.

4 marks awarded

Q2c Describe how lifestyle choices may influence the development of cancer. [5]

Student's response

Smoking damages lung cells so increases lung cancer. Smoking causes morefree radicals to enter the body. These free radicals damage the DNA of cells so increase the risk of the cells rapidly dividing. Smoking also has chemicals like tar and arsenic which cause damage to cells. Furthermore too much sun exposure can lead to skin cancer as too much UV rays damages the DNA in skin cells so this spreads quickly through skin cells causing skin cancer. Excessive alcohol consumption increases cancer risk. Alcohol converted into acetaldehyde in body which damages DNA of mouth cells leading to mouth cancer. Also increases liver cancer.

Examiner's comments

Full marks were awarded because the response demonstrated a highly competent level of knowledge and understanding with clear use of subject specific terminology.

5 marks awarded

Q3a List **two** non-modifiable risk factors for cardiovascular disease. [2]

Student's response

Genetics

Gender

Examiner's comments

Two non-modifiable factors were clearly listed from a possible number that could have been given.

2 marks awarded

Q3b Discuss the effect of each of the following on the development of cardiovascular disease:

Student's response

Hypertension [2]

This increases the individual's blood pressure and puts increased pressure on the blood vessels, weakening them which may cause artery narrowing and atherosclerosis.

Fatty acids [4]

Saturated fatty acids increase total and low density lipoprotein cholesterols in the body, leading to fatty deposits called atheroma blocking the arteries and narrowing them, leading to atherosclerosis and coronary heart disease. Unsaturated fatty acids include n-3 which raises LDL cholesterol and maintains HDL cholesterol, increasing atherosclerosis risk and strokes and N-6 increases total body cholesterol which increases risk of heart attacks and strokes.

Examiner's comments

HYPERTENSION – a full discussion was given by the candidate demonstrating understanding of the effect of hypertension on cardiovascular disease. The response was concise, clear and accurate.

2 marks awarded

FATTY ACIDS – the start of the discussion was accurate and showed knowledge and understanding of the effect fatty acids could have on the development of cardiovascular disease. The second half of the answer was inaccurate and was not credited.

2 marks awarded

Q3c Discuss the nutritional consequences of excessive alcohol consumption for adults. [5]

Student's response

Excessive alcohol consumption can cause reduced fat metabolism in the body, a deficiency of vitamin K as it seizes bile meaning the bile can no longer produce it, a deficiency of vitamin D which will impair calcium absorbtion and lead to low bone density as it breaks down active forms of vitamin D. It will also cause low iron status due to it causing iron toxicity and low levels in the blood due to internal bleeding from intestinal irritation. Finally, zinc status and deficiency occurs occurs as alcohol is reliant on zinc to break it down and alcohol limits absorbtion of zinc and the nutrients it relies on to function causing delayed wound healing and immune system problems. It also means that alcohol cannot be broken down in the body due to this zinc deficiency.

Examiner's comments

A wide range of nutritional consequences were identified. Zinc status and deficiency of vitamin D were particularly well discussed.

4 marks awarded

Section B

Quality of written communication is assessed in this section.

Answer **three** questions from this section.

Write your answers in the Answer Booklet provided.

Q4 Propose and justify dietary and lifestyle recommendations to achieve a healthy weight in adulthood. [15]

Student's response

Firstly to achieve healthy weight in adulthood don't skip breakfast as skipping breakfast will increase hunger throughout the day so will lead to increased grazing. Grazing means you are unaware of how much you are eating so will eat more leading to a positive energy balance which increases fat stores leading to obesity. So eating breakfast will reduce snacking on unhealthy energy dense snacks and will lead to less weight gain.

Secondly, choose lower fat options eg low fat semi skimmed milk. These options are better for you as they have a lower fat and calorie content so won't contribute to a positive energy balance. They will ensure you stay in a neutral energy balance which will help the adult stay at a healthy body weight to reduce intra abdominal obesity which increases risk of developing type 2 diabetes and cardiovascular disease.

Thirdly, prepare meals yourself. This means you can know what's exactly in them and can ensure you use low fat options to keep the calories low, cooking yourself avoids takeaways as they are high in fat and salt which are energy dense leading to increased risk of obesity as the portion sizes are large so causes overeating.

Furthermore, increase soluble fibre foods in the diet as they help increase satiety in the body so displace fatty food. They will make you feel fuller for longer so will reduce snacking on low nutrient energy dense snacks to help maintain neutral energy balance and maintain a healthy weight to reduce dietary related disorders more common in adults eg CVD.

Adults should cut down on their leisure time. The most common leisure time now a days is watching TV. The average person watches 25 hours of TV a week. Watching TV is commonly linked with boredom which leads to increased snacking on energy dense foods, so in free time join a sporting club to ensure you have consistant exercise routine which will burn off some of the calories eaten so help to create neutral energy balance to have healthy weight.

Following this, the adults should ensure a good sleeping pattern. As sleeping pattern affects our hormones. When lack of sleep becomes a chronic problem levels of grehlin hormone increase which increases our appetite encouraging us to eat

more, and the leptin hormone levels decrease which normally supresses our appetite so this causes our appetite to increase so adults will eat more. So good sleep will increase leptin to help control our appetite to prevent unnecessary eating which would lead to a positive energy balance causing fat stores to increase and lead to obesity.

Adults should reduce sedentary activities in their day. For example having a sedentary job will cause not many calories to be burned off during their workday and they could lack motivation and desire to cook fresh healthy meal when they come home. So in their sedentary job they should take walks on their breaks so help move the body and burn off calories to prevent positive energy balance which leads to obesity.

Reduce stress for situations in their life as they can lead to comfort eating on high fat, salt, sugar foods causing positive energy balance and if it continues in long term will make it difficult to lose the weight.

Examiner's comments

This response was worthy of top band marks because the key words of the question i.e. propose, justify, diet and lifestyle were all addressed. The quality of written communication was highly competent. There was clear structure to the response for example each paragraph started by proposing advice and then the candidate developed the response by giving reasons for the advice while focusing on adults.

13 marks awarded

Q5 Explain how the following factors may affect food choice and eating patterns: [15]

- demographics
- employment
- leisure

Student's response

Demographics impact food choice and eating patterns for example there are more people now living in single households. These people living on their own tend to buy more meals for one, takeaways and ready meals because they feel that it is more economical. They don't believe it is worth the time, money and effort to cook for just one person. Therefore as a result they consume more fatty, sugary and salty foods.

In some households the typical gender roles have been reversed, the men stay at home and the women go out to work. In some but not all cases, the man may have poor cooking skills and may not be able to provide nutritious meals for the children.

However there has also been a rise in dual earner families. This means that there will be more disposable income in the household. This may result in more frequent meals out and higher expenditure on convenience foods. In dual earner families, the parents often have a lack of time and this can result in less time spent cooking and preparing food and more time eating out. Unfortunately convenience foods are often high in fat salt and sugar. Therefore this will have a negative impact on the diets of the family members. These families also tend to have fewer sit down family meals and this encourages poor eating habits among children.

Also if a mother is out working all day when she gets home it is unlikely she will feel like starting to prepare labour intensive fruit and vegetables.

On the other hand there are still many parts of the UK were unemployment is a big problem. In these households they may have a lack of money and therefore it is hard for them to afford to buy fresh fruit and vegetables. Therefore they often resort to cheap, energy-dense nutrient poor foods from takeaways.

In terms of leisure in the past number of years there has been an increase in the amount of fast food outlets. This has created an obeseogenic environment, with the wide availability of this cheap convenient food, people tend to be more tempted to buy it and this causes unhealthy food choices and poor eating patterns.

There has also been a rise in the number of coffee shops and many people aged 19-30 start their day with a visit to a shop such as Starbucks these drinks are often high in sugar and are accompanied with an unhealthy snack.

Examiner's comments

This response was awarded marks in the top band because it stayed focused on the question throughout and the explanations were clear. A very good level of knowledge was evident for all three factors.

12 marks awarded

Q6 Describe the risk factors that may increase the development of Type 2 diabetes and outline dietary recommendations to help manage this condition. [15]

Student's response

Type 2 diabetes is when the body cannot produce enough insulin to cope with the high blood glucose levels or the insulin that it does produce is faulty and doesn't work properly.

Obesity is one risk factor which increases the development of type 2 diabetes. This will reduce insulin sensitivity to insulin and reduce the insulin production as fat cells are less sensitive to insulin production. Reduced insulin sensitivity will mean that there is little control over blood glucose levels, resulting in rapid rises in blood glucose levels increasing the development of type 2 diabetes. 90% of all type 2 diabetics are obese.

The diet is another risk factor which can cause the development of type 2 diabetes. A diet high in simple sugars will result in rapid spikes in blood glucose levels which can lead to the development of type 2 diabetes. These simple carbohydrates have a high glucose content which is meant to provide immediate energy to the body. If the body does not expend this extra energy, it is stored in the adipose tissue for longer term storage which can result in a positive energy balance occurring and eventually obesity. Obesity is a major risk factor for type 2 diabetes.

Excessive alcohol consumption can also increase the risk of type 2 diabetes. Alcohol is high in glucose and can cause rapid peaks in blood glucose levels. If alcohol isn't carefully moderated it will initially rise blood glucose levels but then slowly fall afterwards. This compromises the liver's ability to convert protein into glucose and this can result in extremely low blood glucose levels called hypoglycaemia.

To help manage type 2 diabetes, individuals should aim to eat a diet which has an increase in starchy carbohydrates. These help release glucose into the bloodstream at a much slower rate over a longer period of time which prevents rapid peaks in blood glucose levels. Individuals should also aim to include at least 30g of dietary fibre in their diet. Dietary fibre provokes a feeling of satiety, helping an individual

stay fuller for longer. This will reduce grazing on high sugar snacks, which helps to control blood glucose levels and avoid rapid peaks. Finally, individuals with type 2 diabetes should also aim to eat sugars as part of a meal rather than a snack on it's own. Eating sugar as part of a meal will help to manage diabetes as it will prevent rapid spikes in blood glucose levels which helps to manage this condition.

Another risk factor which can cause the development of type 2 diabetes is genetics. If a mother or father has type 2 diabetes, the risk of the child getting it is 15%. However, if both the mother and father have type 2 diabetes, the risk for the child developing the condition is 75%. If a non-identical twin has type 2 diabetes, the risk of the child developing it is 10% but if an identical twin has type 2 diabetes, the risk of the child developing it is 90%. Finally, polycystic ovary syndrome increases the risk of the child developing type 2 diabetes.

Examiner's comments

The candidate accurately identified obesity as a risk factor for Type 2 diabetes and clearly described how it could increase the risks of this disease. There was some reference to genetic factors at the end of the answer but the response was not awarded marks in the top band because more risk factors could have been included. The candidate was able to outline briefly some dietary recommendations to manage the condition.

11 marks awarded

Q7 Identify the current guidelines for physical activity in children and discuss the health benefits of regular physical activity for this age group. [15]

Student's response

Children should be active for 60 minutes each day. This can include moderate activity such as walking or vigorous cycling to reduce the risk of obesity in later.

Those children who are involved in exercise will have a leaner body composition as they will have less fat on their body. It will also improve how the body stores fat and usually will improve stamina levels. Children will also be at a decreased risk of diseases in later life if their weight is regulated.

Those children who are active have a less chance of becoming overweight in later life. This is due to children who usually have a defict of calories which can be used to be burnt off as fat within the body.

They will also have a maintained energy balance. This is the rate at which the body burns calories and increases as you exercise in this case for children.

As children's bones are still developing, it is important for exercise to strengthen bones and osteoblasts. Exercise from a young age can decrease the risk of developing osteoporosis in later life especially for women. Exercise is needed for skeletal growth and to ensure the bones are strong.

As the child exercises, more blood is flowed around the body to all cells and tissues. Exercise helps to pump blood around the body so all cells are oxygenated. This can make the heart stronger.

Exercise is important for creating new neurons in the brain and stimulating a sense of well-being. Exercise can improve emotional well-being such as sleep for children and improve their self-esteem.

Psychological well-being is also important as exercise is proven to reduce the levels of depression in children. This is as it releases endorphins which makes the child feel happier.

As the child is still developing it is important for exercise to improve immunity and reduce the number of infections.

Examiner's comments

The candidate clearly and accurately stated the current guideline for physical activity in children and credit was awarded accordingly. The answer should have included more discussion of the health benefits of physical activity for this age group. Some reference was made to children but the quality of discussion and written communication was deemed to be competent rather than highly competent.

10 marks awarded

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