



ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017

Nutrition and Food Science

Assessment Unit AS 2

assessing

Diet, Lifestyle and Health

[SNF21]

MONDAY 22 MAY, AFTERNOON

MARK SCHEME

General Marking Instructions

Introduction

The main purpose of the mark scheme is to ensure that examinations are marked accurately, consistently and fairly. The mark scheme provides examiners with an indication of the nature and range of candidates' responses likely to be worthy of credit. It also sets out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives

Below are the assessment objectives for Nutrition and Food Science.

Candidates should be able to demonstrate:

- AO1** knowledge and understanding of the specified content
- AO2** the ability to apply knowledge, understanding and skills in a variety of situations and to analyse problems, issues and situations using appropriate skills
- AO3** the ability to gather, organise and select information, evaluate acquired knowledge and understanding, and present and justify an argument

Quality of candidates' responses

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity that may reasonably be expected of a 17 or 18-year-old, the age at which the majority of candidates sit their GCE examinations.

Flexibility in marking

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 17 or 18-year-old GCE candidate.

Awarding zero marks

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Types of mark schemes

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

Levels of response

In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement.

The following guidance is provided to assist examiners.

- **Threshold performance:** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- **Intermediate performance:** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- **High performance:** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

Quality of written communication

Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

- Level 1: Quality of written communication is basic.
- Level 2: Quality of written communication is adequate.
- Level 3: Quality of written communication is competent.
- Level 4: Quality of written communication is highly competent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

Level 1 (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 the intended meaning is not clear.

Level 2 (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.

Level 3 (Competent): The candidate makes a good attempt to select and use an appropriate form and style of writing. Relevant material is organised with a good degree of clarity and coherence. There is widespread use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

Level 4 (Highly competent): The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is succinct, well organised and displays a high degree of clarity and coherence. There is extensive and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of the highest standard and ensure that meaning is absolutely clear.

Section A		AVAILABLE MARKS
1	(a) (i) What do the letters EAR represent in relation to energy? (AO1) EAR – Estimated Average Requirement	[1]
	(ii) Account for the difference in energy requirements between males and females. (AO1, AO2) <ul style="list-style-type: none"> • less muscle mass • differences in body size and weight • females have more adipose tissue which is metabolically less active than lean tissue All other valid points will be given credit	[2]
	(b) List three factors that may affect energy balance. (AO1, AO2) <ul style="list-style-type: none"> • food intake • physical activity • basal metabolic rate (BMR) All other valid points will be given credit	[3]
	(c) Comment on why energy requirements change among the three age groups. (AO1, AO2) <ul style="list-style-type: none"> • energy requirements decrease with age regardless of physical activity • older adults need less energy due to changes in body composition, decrease in lean body tissue and an increase in fat tissue • many people are also less active and as they get older will not need energy for growth All other valid points will be given credit	[3] 9

		AVAILABLE MARKS
2	(a) (i) Define cancer. (AO1, AO2)	
	Definition: Cancer starts with a change in one cell or a small group of cells in the body which divide in an uncontrolled way. [2]	
	(ii) Outline how cancer can develop in the body.	
	Cancer develops in the body when abnormal cells multiply which may cause a growth or lump called a tumour. This can continue to grow in one place or spread into other tissues. [2]	
(b)	Explain how meat consumption may influence an individual's cancer risk. (AO1, AO2)	
	<ul style="list-style-type: none"> over-consumption of red meat; if individuals eat more than the recommended 70g daily of red meat, cancer risk increases haem content; haem content of red meat inflames lining of bowel which increases risk of cancer in the bowel overcooking; charring of meat at high temperatures increases risk of amine chemicals linked to cancer nitrites/nitrates found in cured and processed meats increase cancer risk because they form N-nitroso compounds 	
	All other valid points will be given credit [4]	
(c)	Describe how lifestyle choices may influence the development of cancer. (AO1, AO2, AO3)	
	<ul style="list-style-type: none"> being overweight; a high total energy intake will lead to the storage of fat in adipose tissue causing weight gain and obesity increases cancer risk smoking; smoking increases the number of free radicals in the body destroying cells and cigarette smoke contains cancer-causing chemicals which can damage DNA causing cancer cells to grow and multiply alcohol consumption; a high intake of alcohol especially spirits can promote tumours, because ethanol is converted to acetaldehyde which damages cells and increases cirrhosis which can lead to liver cancer and can increase the risk of breast cancer environmental factors; sun exposure can increase the risk of skin cancer because it increases the risk of malignant melanomas 	
	All other valid points will be given credit [5]	13
	brief description: 1–2 marks competent/good: 3–4 marks very good/highly competent: 5 marks	

3 (a) List **two** non-modifiable risk factors for cardiovascular disease. (AO1)

- genetics
- gender
- age
- socio-economic status
- ethnicity
- low birth weight

Any two of the above

AVAILABLE
MARKS

[2]

(b) Discuss the effect of each of the following on the development of cardiovascular disease. (AO1, AO2)

Hypertension

- high blood pressure increases strain on blood vessels which causes narrowing. This causes extra strain on the heart to pump blood around the body and increases the risk of blood clots.

All other valid points will be given credit

[2]

Fatty acids

- atherosclerosis: some fatty acids cause narrowing in the arteries restricting blood flow
- saturated fat raises LDL cholesterol causing damage to arteries which thicken and harden
- Omega 3; can lower risk of clots by lowering LDL cholesterol
- Omega 6; can protect against CVD because it lowers LDL cholesterol
- Trans fatty acids; increase risk of clotting because it increases LDL and lowers HDL cholesterol

All other valid points will be given credit

[4]

(c) Discuss the nutritional consequences of excessive alcohol consumption for adults. (AO1, AO2, AO3)

- hyperlipidaemia; excessive alcohol interferes with fat metabolism in the liver and increases LDL cholesterol
- low blood glucose levels; alcohol disrupts production of glucose and hormones that regulate insulin and can cause hypoglycaemia
- poor nutritional status; excessive alcohol may interfere with the absorption and metabolism of nutrients, e.g. B vitamins, vitamin D and vitamin K
- iron and zinc status; excessive alcohol consumption can lead to low iron status due to internal bleeding and damage to internal organs, zinc absorption is decreased

All other valid points will be given credit

[5]

13

brief description: 1–2 marks

competent/good: 3–4 marks

very good/highly competent: 5 marks

Section B**AVAILABLE MARKS**

Quality of written communication is assessed in this section.

Answer **three** questions from this section.

4 Propose and justify dietary and lifestyle recommendations to achieve a healthy weight in adulthood. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in adulthood
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to propose and justify recommendations
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in adulthood
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to propose and justify recommendations
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in adulthood
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to propose and justify recommendations
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of dietary and lifestyle recommendations to achieve a healthy weight in adulthood
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to propose and justify recommendations
- quality of written communication is highly competent

Examples of suitable points to be proposed by the candidate:**Dietary recommendations**

- eat more fruit and vegetables; fruit and vegetables are low in fat and provide fibre which can have a high satiety effect and help to prevent snacking
- eat breakfast; research indicates that eating breakfast prevents overeating and snacking on high energy foods
- portion sizes; eat normal portions and avoid larger or supersize portion sizes which can result in overeating
- drink more water; drinking water can prevent overeating and reduces the consumption of fizzy drinks

Lifestyle recommendations

- increase physical activity; being physically active enables sedentary energy to be burnt off and so excess energy is not stored as fat resulting in weight gain
- reduce sedentary activities; limit the use of computer games, television and other sedentary activities to maintain a healthy weight
- sleep patterns; sleep deprivation can result in metabolic changes which can diminish the body's ability to process glucose, sleep deprivation can affect appetite and can result in overeating

All other valid points will be given credit

[15]

AVAILABLE
MARKS

15

5 Explain how the following factors may affect food choice and eating patterns:

- demographics
- employment
- leisure (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of factors affecting food choice and eating patterns
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how demographics, employment and leisure affect food choice and eating patterns
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of factors affecting food choice and eating patterns
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how demographics, employment and leisure affect food choice and eating patterns
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of factors affecting food choice and eating patterns
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how demographics, employment and leisure affect food choice and eating patterns
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of factors affecting food choice and eating patterns
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how demographics, employment and leisure affect food choice and eating patterns
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

Demographics

- household size; there are more single households which have resulted in larger numbers of single portions ready meals and convenience foods and 'meals for one' which are often high in fat, sugar or salt.
- eating away from home; population studies reveal that 30% of all food eaten is outside of the home and there is a wide choice of easily accessible fast food and take away options
- availability; there are more food outlets including deli counter foods in retail shops, garages supplying a wide range of ready to eat foods at relatively cheap prices

Employment

- higher disposable income; more income is available when both parents work full time and more income is spent on food
- time available; full-time employment can result in less time available to prepare meals and more prepared, processed or convenience meals may be eaten
- less family meal times; patterns of employment schedules including shift patterns have resulted in less rigid meal patterns where the family eat the main meal together

AVAILABLE MARKS

Leisure

- watching television; the most common leisure activity in the UK is watching television and many people consume ready to eat snacks while watching television and there is greater exposure to advertisements which can impact choice of food
- social activities; many leisure activities involve socialising in restaurants, coffee shops, cinema and pubs where food and alcohol are associated as a normal part of relaxation and leisure time
- holidays; more leisure time is spent travelling which can have an impact on eating patterns and choices of food eaten

All other valid points will be given credit

[15]

15

6 Describe the risk factors that may increase the development of Type 2 diabetes and outline dietary recommendations to help manage this condition. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of the risk factors that may increase the development of Type 2 diabetes
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe the risk factors and outline dietary recommendations to help manage this condition
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of the risk factors that may increase the development of Type 2 diabetes
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe the risk factors and outline dietary recommendations to help manage this condition
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of the risk factors that may increase the development of Type 2 diabetes
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe the risk factors and outline dietary recommendations to help manage this condition
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of the risk factors that may increase the development of Type 2 diabetes
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe the risk factors and outline dietary recommendations to help manage this condition
- quality of written communication is highly competent

Examples of suitable points to be described by the candidate:

Risk factors

- being overweight; fat cells are more resistant to insulin than muscle cells, and if an individual has more fat cells due to being overweight, the insulin becomes less effective and increases risk of developing diabetes
- central obesity; individuals who carry excess weight around the waist are more likely to suffer from hypertension due to the pressure placed on the heart which also increases risk of developing diabetes
- other risk factors: family history, heredity, age, ethnicity

Dietary recommendations

- eat regularly; eating regularly helps to control appetite and blood glucose levels, avoid skipping meals which can adversely affect blood glucose
- follow healthy guidelines; eat less saturated fat and salt because diabetics have a greater risk of cardiovascular disease, diabetics should try to maintain a healthy weight by eating a diet that is low in fat and high in fruit, vegetables and starchy carbohydrate foods
- eat more pulses; beans, peas and lentils are lower in fat, high in fibre and don't have a big impact on blood glucose and help to control cholesterol
- eat mainly low GI foods; these foods break down more slowly releasing glucose gradually into the bloodstream, they may help control blood glucose levels and improve satiety
- avoid high GI foods; these foods break down quickly during digestion they raise blood sugar levels higher and more quickly, e.g. white rice, potatoes, this can be useful for a diabetic to eat before exercise or when they need glucose quickly

All other valid points will be given credit

AVAILABLE
MARKS

[15]

15

7 Identify the current guidelines for physical activity in children and discuss the health benefits of regular physical activity for this age group. (AO1, AO2, AO3)

AVAILABLE MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of current guidelines for physical activity in children
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss the health benefits of regular physical activity for children
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of current guidelines for physical activity in children
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to discuss the health benefits of regular physical activity for children
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of current guidelines for physical activity in children
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to discuss the health benefits of regular physical activity for children
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of current guidelines for physical activity in children
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to discuss the health benefits of regular physical activity for children
- quality of written communication is highly competent

Examples of suitable points to be discussed by the candidate:

Current guidelines for physical activity in children

- All children should engage in moderate to vigorous intensity physical activity for at least 60 minutes every day

Health benefits

- control of body weight; being active and taking regular exercise increases energy output and helps maintain a healthy weight
- self-confidence; being active can improve social skills, develop team building and friendships especially in children
- cardiovascular health; being active reduces the risk of heart disease because it can help improve the balance of HDL and LDL cholesterol and can reduce blood pressure

- improved mental health; regular physical activity helps to deal with anxiety and stress, being active can help with anger management as well as reducing the risk of stress, anxiety and depression
- builds skeletal muscle and bone; physical activity increases body strength and activity that is weight bearing reduces the risk of osteoporosis

All other valid points will be given credit

[15]

AVAILABLE
MARKS

15

Total

80