



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2022**

Nutrition and Food Science

Assessment Unit AS 2

assessing

Diet, Lifestyle and Health

[SNF21]

TUESDAY 7 JUNE, 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.

COVID-19 Context

Given the unprecedented circumstances presented by the COVID-19 public health crisis, senior examiners, under the instruction of CCEA awarding organisation, are required to train assistant examiners to apply the mark scheme in case of disrupted learning and lost teaching time. The interpretation and intended application of the mark scheme for this examination series will be communicated through the standardising meeting by the Chief or Principal Examiner and will be monitored through the supervision period. This paragraph will apply to examination series in 2021–2022 only.

Section A

AVAILABLE
MARKS

1 (a) State **two** symptoms of Type 2 diabetes. (AO1)

- frequent urination
- increased thirst

All other valid points will be given credit

[2]

(b) Explain why individuals with Type 2 diabetes are advised to limit their fat intake. (AO1, AO2)

- fat is high in calories, taking in more calories than the body needs causes weight gain, which may affect individuals with Type 2 diabetes as they become insulin resistant
- the type of fat is also important as saturated fat causes high levels of LDL cholesterol, which increases CVD risk for individuals
- individuals with Type 2 diabetes are at an increased risk of CVD, lowering fat helps reduce the risk

All other valid points will be given credit

[0]–[1] basic explanation

[2] competent explanation

[3] highly competent explanation

[3]

(c) Propose and justify **one** lifestyle recommendation for the prevention of Type 2 diabetes. (AO1, AO2, AO3)

Recommendation: substitute sedentary behaviour with standing or light-intensity physical activity

Justification: sitting down for long periods can result in changes in metabolism including insulin resistance which can lead to Type 2 diabetes. Increasing physical activity levels helps maintain a healthy weight which minimises the risk of developing Type 2 diabetes.

All other valid points will be given credit

[0]–[1] basic justification

[2] competent justification

[3] highly competent justification

[3]

8

- 2 (a) Explain how meat and alcohol consumption may increase the risk of cancer. (AO1, AO2)

AVAILABLE
MARKS

Meat consumption

- red meat contains higher levels of haem, which is carcinogenic, meat has slow moving transit time in the gut increasing risk of cancer development
- cured meats, e.g. ham, bacon produce nitrosamines from the nitrites during the curing process, these are carcinogenic
- grilling, burning and barbecuing meat at high temperature produces heterocyclic amines and polycyclic aromatic hydrocarbons which are carcinogenic

All other valid points will be given credit

[0]–[2] basic explanation

[3] competent explanation

[4] highly competent explanation [4]

Alcohol consumption

- alcohol is converted into a toxic substance, acetaldehyde, in the liver, this damages DNA and stops cells from repairing damage
- alcohol increases the level of some hormones, oestrogen and insulin; hormones provide the body with messages of when cells should grow and divide
- alcohol affects cells between the mouth and throat, which make it easier for other carcinogens to be absorbed

All other valid points will be given credit

[0]–[2] basic explanation

[3] competent explanation

[4] highly competent explanation [4]

- (b) Outline why breastfeeding is a protective factor in cancer development. (AO2, AO3)

- the ovaries do not produce eggs as often during breastfeeding decreasing oestrogen due to delayed menstruation, longer time breastfeeding lowers the risk
- breastfeeding changes the cells in the breast so they might be more resistant to changes that lead to cancer

All other valid points will be given credit

[0]–[1] basic outline

[2] competent outline [2]

10

3 (a) Explain **three** reasons why the body needs energy. (AO1, AO2, AO3)

- basal metabolism; is the energy needed to help the body function while at rest, e.g. circulation, respiration, excretion, keeping the body warm and functions of vital organs. Energy needs for basal metabolism differ according to age, gender and health
- physical activity level (PAL); energy is needed for physical activity levels and work. The more active a person the greater the energy need compared to someone who is sedentary. Individuals with a high lean body mass to fat ratio have greater energy needs than someone with high body fat composition
- body composition; muscle is the body's most metabolic tissue; it requires energy to maintain itself. Men need more energy than women as they are naturally more muscular. Children and young adults require more energy as they change in height and weight but as people age their energy requirements decrease as muscle tissue gradually declines
- pregnancy and lactation; during pregnancy an extra 200 kcal/day is required in the third trimester to meet the needs of the growing foetus and lay down stores in the mother for breastfeeding

All other valid points will be given credit

[0]–[2] basic explanation

[3]–[4] competent explanation

[5]–[6] highly competent explanation [6]

(b) State **two** diet related disorders associated with positive energy balance. (AO1)

- obesity
- Type 2 diabetes

All other valid points will be given credit [2]

AVAILABLE
MARKS

8

4 (a) State **three** current recommendations for physical activity in children and young people aged 5–18 years. (AO1)

- 60 minutes of activity every day, e.g. walking
- engage in moderate to vigorous intensity physical activity
- activities that strengthen muscle and bone should be included at least 3 times per week
- children should reduce the time spent being sedentary (sitting) for extended periods

[0]–[1] basic statement of the recommendations

[2] competent statement of the recommendations

[3] highly competent statement of the recommendations [3]

(b) Explain how physical activity can benefit the mental health of children. (AO2, AO3)

- physical activity boosts mood and lowers rates of depression as endorphins are released
- physical activity can help manage stress, anxiety or intrusive and racing thoughts. Physical activity releases cortisol which helps manage stress. Being physically active also gives the brain something to focus on which is a positive coping strategy
- doing group or team activities can help the child connect with others and make friends boosting self confidence
- being more active can help the child feel better about themselves and improve self-esteem

All other valid points will be given credit

[0]–[2] basic explanation

[3]–[4] competent explanation

[5]–[6] highly competent explanation [6]

Section A

**AVAILABLE
MARKS**

9

35

Section B

AVAILABLE
MARKS

Quality of written communication is assessed in this section.

- 5 The Health Survey (NI) 2019/2020 found that 65% of adults were either overweight or obese.

Source: Department of Health NI 2021

Consider possible reasons for this figure. (AO1, AO2, AO3)

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of overweight and obesity in adults
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to consider reasons for the figure quoted
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of overweight and obesity in adults
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to consider possible reasons for the figure quoted
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of overweight and obesity in adults
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to consider possible reasons for the figure quoted
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of overweight and obesity in adults
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to consider possible reasons for the figure quoted
- quality of written communication is highly competent

Examples of suitable points to be considered by the candidate:

- sedentary lifestyle/jobs; adults own more computers, electronic devices or watch more television/screen time which reduces outdoor leisure activities contributing to a reduction in energy expenditure; increased number of jobs/occupations are sedentary rather than manual so they are not physically demanding

- reduced physical activity; adults lack time to join the gym or go to the swimming pool to take part in physical activity, which reduces energy expenditure; physical activity is not a natural part of the adults' lifestyle
- alcohol consumption; alcohol has a high calorific content with 1 g yielding 7 calories increasing positive energy balance
- low intake of fruit and vegetables; there is an increasing number of adults not eating the 5 portions recommended each day instead opting for sugary drinks and snacks or confectionery; these are more energy dense and contribute to weight gain
- loneliness; an increasing number of adults show signs of loneliness contributing to snacking, grazing, comfort eating on high fat, sugar foods causing energy imbalance
- food availability; there is a greater choice of food available 24/7, this can lead to increased intake of high calorific foods increasing risk of weight gain
- portion size; portion sizes tend to be larger and have become the norm, this increases food intake and total energy intake

All other valid points will be given credit

[15]

AVAILABLE
MARKS

15

- 6 Describe the non-modifiable risk factors involved in the development of cardiovascular disease. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of non-modifiable risk factors involved in the development of cardiovascular disease
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to describe these non-modifiable risk factors for cardiovascular disease
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of non-modifiable risk factors involved in the development of cardiovascular disease
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to describe these non-modifiable risk factors for cardiovascular disease
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of non-modifiable risk factors involved in the development of cardiovascular disease
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to describe these non-modifiable risk factors for cardiovascular disease
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of non-modifiable risk factors involved in the development of cardiovascular disease
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to describe these non-modifiable risk factors for cardiovascular disease
- quality of written communication is highly competent

Examples of suitable points to be described by the candidate:

- genetics; a family history of heart or circulatory disease of a first degree male relative before the age of 55 or a mother or sister before the age of 65, increases the risk of cardiovascular disease; this also includes disorders of lipid metabolism. Genes can also pass on high blood pressure, high cholesterol or lifestyle habits that increase risk of cardiovascular disease
- gender; men are more likely to develop cardiovascular disease at an earlier age than premenopausal women but as women get older the risk narrows
- age; with increasing age there is an increasing risk of developing atherosclerosis; the older an individual the more likely they are to develop coronary heart disease or have a cardiac event, e.g. angina, heart attack or stroke, the risk of stroke doubles every decade after age 55

- socio-economic status; there is a higher risk associated with lower socio-economic status, people's income and type of jobs they do affect risk of cardiovascular disease; manual workers are more likely to be at risk than non-manual workers, people who live in poorer areas or are on low incomes are more likely to get cardiovascular disease
- ethnicity; some ethnic groups have a different level of risk, South Asian people living in the UK are at higher risk compared to the UK population, African Caribbean backgrounds have a higher than average risk of developing high blood pressure
- low birth weight; an individual who is small for gestational age at birth has a greater risk of cardiovascular disease in later life

All other valid points will be given credit

[15]

**AVAILABLE
MARKS**

15

- 7 Explain how information on a food label can be a barrier to making healthy food choices. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of food labelling
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how information on a food label can be a barrier to healthy food choices
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of food labelling
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how information on a food label can be a barrier to healthy food choices
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of food labelling
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how information on a food label can be a barrier to healthy food choices
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of food labelling
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how information on a food label can be a barrier to healthy food choices
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- confusing information; inconsistency, legibility and design of information on labels can be a barrier as font size used can be small, information is closely packed together, and information is in same format or colouring. This causes confusion due to information overload and can prevent healthy choices
- nutritional claims; food labelling can be a barrier as the information may be difficult to interpret or misleading, for example food labels claiming to have no cholesterol in the food may be high in sugar preventing healthy food choices
- health claims; words and terms used on food labels can be a barrier as they can be vague, for example 'pure', 'healthy' and 'wholesome'. This wording may be misleading as it suggests health benefits if the food is chosen

- portion size/serving size; the serving size stated on food labels of commonly eaten foods, e.g. cereals, biscuits are substantially less than the realistic portion consumed; manufacturers have flexibility in deciding portion/serving size, the label can prevent healthy food choices as the smaller serving size implies it may be healthier than a comparable product with larger serving size; the label can be a barrier as there is confusion between information per serving and per package
- nutritional data; numeric nutrition information, for example percentages, reference to dietary guidelines can be a barrier as it is complex, detailed and difficult to understand; the label prevents healthy food choices as an accurate nutritional profile may not be obtained as further calculations may be required. Information is presented per 100 g or per serving rather than actual serving size
- front of pack labelling; the variety of front of pack information can be a barrier as it is overly numerical or requires complex calculations; green, amber or red symbols are used to indicate how freely foods can be eaten but some foods may be green for one nutrient but red for another preventing healthy food choices; use of percentages on front of pack labels may be a barrier as they are not as easily understood as using the terms high, medium and low; some food manufacturers use monochrome symbols which are difficult to interpret

All other valid points will be given credit

[15]

AVAILABLE
MARKS

15

- 8 Explain how plant-based eating helps to prevent a range of diet related disorders. (AO1, AO2, AO3)

AVAILABLE
MARKS

Mark Band ([0]–[3])

Overall impression: basic

- inadequate knowledge and understanding of plant-based eating
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain how plant-based eating reduces the risk of diet-related disorders
- quality of written communication is basic

Mark Band ([4]–[7])

Overall impression: adequate

- adequate knowledge and understanding of plant-based eating
- demonstrates an adequate ability to apply appropriate knowledge and understanding to the question
- demonstrates an adequate ability to explain how plant-based eating reduces the risk of diet-related disorders
- quality of written communication is adequate

Mark Band ([8]–[11])

Overall impression: competent

- competent knowledge and understanding of plant-based eating
- demonstrates a competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a competent ability to explain how plant-based eating reduces the risk of diet-related disorders
- quality of written communication is competent

Mark Band ([12]–[15])

Overall impression: highly competent

- highly competent knowledge and understanding of plant-based eating
- demonstrates a highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a highly competent ability to explain how plant-based eating reduces the risk of diet-related disorders
- quality of written communication is highly competent

Examples of suitable points to be explained by the candidate:

- plant-based eating; a plant-based diet containing foods derived from plants, including vegetables, wholegrains, legumes, nuts, seeds and fruits, with few or no animal products lowering the incidence of many disorders
- diet related disorders; a well-planned plant-based diet is low in fat and helps to manage weight and may reduce the risk of cancer, cardiovascular disease, Type 2 diabetes and obesity
- increased fruit and vegetable intake reduces the risk of developing diabetes by almost a quarter; fruit and vegetables provide vitamins, minerals, antioxidants and fibre; fibre shortens the time food takes to pass through the digestive tract reducing the exposure to carcinogens and reducing the risk of cancer; antioxidants help protect the heart
- dairy alternatives; soya and plant-based drinks provide many of the nutrients in cow's milk but with low levels of total fats reducing the risk of cancer, obesity and diabetes; they have cholesterol lowering benefits

- beans, pulses and other proteins; beans, peas and lentils release their energy slowly which is good for the heart and preventing weight gain
- excludes meat, fish, eggs and dairy; this lowers LDL and total cholesterol, blood pressure, insulin and inflammation; this lowers the risk of cardiovascular disease and diabetes
- reduced processed and red meat; chemicals involved in processing increase the risk of colorectal cancer

All other valid points will be given credit

[15]

Section B

Total

**AVAILABLE
MARKS**

15

45

80