



Pearson



Examiners' Report/
Lead Examiner Feedback

June 2018

BTEC Level 3 Nationals in Sport and Exercise
Science

Unit 13: Nutrition for Sport and Exercise
Performance (31824H)



Edexcel and BTEC qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications website at <http://qualifications.pearson.com/en/home.html> for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at <http://qualifications.pearson.com/en/contact-us.html>

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson. Their contact details can be found on this link: <http://qualifications.pearson.com/en/support/support-for-you/teachers.html>

You can also use our online Ask the Expert service at <https://www.edexcelonline.com>
You will need an Edexcel Online username and password to access this service.

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your learners at: www.pearson.com/uk

June 2018

Publications Code 31824H_1806_ER

All the material in this publication is copyright

© Pearson Education Ltd 2018

Grade Boundaries

What is a grade boundary?

A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade (Distinction, Merit, Pass and Near Pass). The grade awarded for each unit contributes proportionately to the overall qualification grade and each unit should always be viewed in the context of its impact on the whole qualification.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark should be for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each test we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each test, because then it would not take into account that a test might be slightly easier or more difficult than any other.

Grade boundaries for this, and all other papers, are on the website via this link: qualifications.pearson.com/gradeboundaries

Unit 13: Nutrition for Sport and Exercise Performance.

Grade	Unclassified	Near Pass	Pass	Merit	Distinction
Boundary Mark	0	9	18	28	39

Introduction

This was the third series of the new specification. The method of external assessment was by a task based approach. The number of learners that sat this external assessment was comparable with summer 2017.

The question paper followed the same format identified in the sample assessment material and the last two series with a nutritional programme provided as part A and then part B contained unseen information regarding the client details, their sport and the phase of the event that they were in. There are three activities based on the part A and part B information each of which is marked using a levels based approach, where the overall quality of the response is considered rather than identifying individual marking points.

Introduction to the Overall Performance of the Unit

It should be noted that for this series, the standard of learner evidence was comparable with the summer 2017 series, however, misinterpretation of the information provided during the unseen element lead to some incorrect nutritional strategies being provided for activity 2 which resulted in a lowering of the grade boundaries for this series at pass level.

There was a wide spread of marks, learners were able to achieve marks across all grade bands. The scripts showed that learners could organise their time to assess the information provided in the part B and then provide structured and coherent answers in the two and half hours of allocated time.

Individual Questions

Activity 1

In this activity learners had to interpret the nutritional programme for Ola in relation to her health and well being.

Good responses provided nutritional analysis of the percentage of macro nutrients consumed on a daily basis and compare these to recommended amounts.

The table below shows the types of information learners could research after having received part A.

Day	Total Cals	CHO %	CHO g	Fat %	Fat g	Protein %	Protein g
Monday	2360	54	320	31	80	15	90
Tuesday	2620	58	380	34	100	8	50
Wednesday	3150	47	370	43	150	10	80
Thursday	2710	50	340	37	110	13	90
Friday	2920	46	335	43	140	11	80
Saturday	3030	44	330	46	150	12	90
Sunday	2900	55	400	31	100	14	100

As the client was eating more calories than required on a daily basis, analysis related to grams of each macronutrient intake would have been misleading and would have shown that the client was consuming too much of each macronutrient. However, a percentage analysis shows that they are consuming insufficient protein intake and often carbohydrate intake is too low. Fat intake is consistently too high from analysis of either grams consumed on a daily basis or percentage intake.

Where learners did relate this to health and wellbeing it was usually related to eating too much fat and a link to Coronary heart disease or high blood pressure. Some learners were able to discuss in detail the health link related to eating high fat foods causing blockage of the coronary arteries and linking this to CHD which was good knowledge. In a number of cases learners linked drinking fizzy drinks as being high fat options which is incorrect as the high simple carbohydrate content is the main nutritional concern.

It is expected that further interpretation of the client information should be included in the interpretation of the food intake including:

- Body Mass index which was 23.5 and therefore classed as in the normal

range.

- BIA was at 9% which is classed as low body fat.
IT was therefore expected that learners would be able to make the link to the fact the person must have a relatively high muscle mass to score at the high end of the normal range on the BMI yet have a very low body fat.
- Basal metabolic rate could then be worked out using the Harris Benedict equation to work out the calorie intake for the person based on their specific details:

$$\begin{aligned} \text{BMR} &= 66.5 + (13.75 \times 76 \text{ kg}) + (5.003 \times 180 \text{ cm}) - (6.755 \times 15 \text{ years}) \\ &= 66.5 + 1045 + 900.54 - 101.3 \\ &= 1911 \text{ kcalories (1910.74)} \end{aligned}$$

A range of activity levels were permitted and included the following:

Plus activity levels:

1.725 = 3296 kcal

1.9 = 3631 kcal

From this information, learners should have been able to interpret that energy intake is below BMR plus activity levels so the person would start to lose body weight if they continued to eat and exercise as per the nutritional programme and also not have sufficient energy to be able to take part in daily activities as well as all the physical activity. .

The balance of food groups (grains, fruit and vegetables, protein, dairy, fats and sweets) was discussed by some learners in relation to the nutritional analysis and/or the Food pyramid and/or the Eatwell plate.

The impact of food preparation on the nutritional composition of food was also discussed by many learners in relation to macronutrient content, however, the impact on health and wellbeing was often a very brief identification if mentioned at all.

Fluid intake was referred to by many learners in relation to recommended daily amounts and types of fluids consumed, however, many learners stated that the client was drinking too much water and was at risk of hyponatremia which is incorrect. The high activity levels meant that the person needed to drink high levels of fluids as a lot of fluid would be lost by sweating.

It should be noted that the focus of this question is on health and wellbeing, learners who did well in this activity did include information how Alex's health and wellbeing could have been affected from her nutritional programme.

Lastly, the factors affecting digestion and absorption of nutrients and fluids should have been commented on in relation to the nutritional programme for the individual with some reference to the timings of food intake and activity levels and timings of the individual

Learners responses were marked by awarding a mark in one of three grade bands:

Grade band 1: 1-5 marks

Grade band 2: 6-10 marks

Grade band 3: 11-15 marks

Grade band 4: 16-20 marks

This response was placed in Band 4: and awarded 20 marks out of 20

Alex is a 15 year old playing in an U16 basketball team. He is currently participating in a county basketball tournament. From looking at ~~Alex and~~ his body measurements, it is clear to see that Alex has a body mass index of 23.46 kg/m^2 . Comparing this to the national average, Alex is classed at a normal weight. This is supported by Alex's BIA result (bioelectrical impedance analysis) which is 9%. BIA is a technique used to assess body composition and unlike BMI, it accounts for lean body mass and body fat so provides a more accurate measure of body composition. With a result of 9%, Alex is considered to be of an ideal weight. This is good because Alex is less likely to fall to the risk of suffering heart disease or a stroke due to his healthy weight, therefore this has a positive impact on his health and well being.

Looking at his nutritional programme, it is possible to calculate his Basal metabolic rate (BMR). Alex has a BMR of ~~1910~~, which reflects 1910 calories, which reflects the energy required for Alex to maintain his body systems at rest. As Alex is very active and exercises everyday, he will need to intake more calories to make up for his expenditure. To calculate his total daily energy expenditure, the Harris - Benedict BMR calculation should be used. The result of this then needs to be multiplied by his activity levels and therefore his TDEE sums to 3296 calories per day. Alex does not meet this throughout his programme and this can cause him to lack energy when training, especially when he has no rest day, it is important for him to eat his required number of calories.

Firstly looking at his carbohydrate intake, it is clear that Alex does not consistently meet the recommended daily allowance (RDA). This states that

at least 50% of calorie daily intake should be made ~~is~~ through carbohydrates. Carbohydrates are the most readily available source of energy in the body. Alex meets this standard four times during the week. His TDEE for carbohydrates however, is 1648 calories which he meets only once, on Tuesday when he consumes 58.02% of carbohydrates equating to which he does not meet at all. This means Alex needs to increase his general intake of calories to meet his TDEE and therefore be able to achieve his carbohydrate TDEE. Alex is not far from meeting his TDEE for carbohydrates and is achieving the RDA. For example on Sunday he consumes 1600 calories from carbohydrates making 55.17% of his diet that day. This is good because he has a basketball competition that day so he will need slow releasing energy from complex carbohydrates plenty of simple carbohydrates for a quick release of energy in between games. He consumes cereal, chocolate and

crisps that day which are all simple carbohydrates meaning they provide Alex with a quick release of energy. This is because they are easily absorbed and digested so provide quicker energy. Saturday is the worst day for Alex in terms of carbohydrates as he is 7% below the minimum RDA and 328 calories below his carbohydrate TDEE. Considering he has 3 hours of basketball training that day, Alex should be aiming to consume his maximum TDEE to ensure he has efficient energy ~~and~~ ~~glycogen~~ stores.

Looking at his fat intake, Alex is consistently above the RDA of 25-30%. This is supported by his fat TDEE which is 988 calories and is exceeded by four times during the week, ranging from 2 - 362 calories above. Fats are important for protecting internal organs and providing a concentrated source of energy. However, eating too much of the wrong fat can lead to an increase in diseases

such as heart failure and diabetes. Alex does do a lot of exercise so he easily burns off the fats he consumes. However, fat provides the largest energy store in the body and if he continues exceeding his TDEE, he could begin to store extra fat. This is negative for his sport, basketball because he needs to be able to run and jump without adding extra pressure on his joints. Alex is 14% over the RDA on Saturday and he consumes 1350 calories from fat that day. He drinks two cans of coca cola and consumes chocolate and crisps. This is to provide a quick release of energy, however they are high in sugar, making them bad sources of fat. He could cut these out to consume healthier sources of fat like nuts or even replace them with cereal bars ~~or~~ for that quick energy release.

Moving onto his protein intake Alex is below the RDA of 15-20% everyday except Monday. On Monday he consumes 15.25% of protein but is again failing to meet his TEE of 659 calories from protein. Alex needs to consume protein as it is essential in maintaining his optimal health. As he has no rest days Alex needs more protein to help his tissues grow and repair. It is also vital to maximise an effective immune function. Alex is significantly below and needs to consume more of the 8 essential amino acids (EAA). He can eat more complete proteins such as eggs, meat and fish which are all of a high biological value making them essential amino acids. His worst day is Tuesday when he only consumes 200

calories from protein making 7.63% of the RDA. This is bad for Alex and his performance as his tissues will not recover as efficiently without sources of protein.

The RDA for water is 2-2.9 litres a day which Alex exceeds ~~everyday~~ everyday. This is good because Alex will not be dehydrated. Alex requires more water to replace the water he loses ~~for~~ through sweat as he trains everyday and needs more fluids for a better performance. He drinks at least 3 litres a day and drinks as much as 4 litres on heavy training days like Saturday where he trains for 3 hours so requires more water to stay hydrated. If Alex was not training as much as he does he could experience water intoxication through hyper hydration. This would occur when drinks too much to avoid dehydration.

If Alex over drinks before his performance, and has a greater water intake to water loss, he could experience a decrease in performance and have a constant need to urinate.

Finally looking at Alex's timing of food it shows he has an early dinner everyday at ~~5pm~~ 5.15pm. On Friday he leaves only 45 minutes to digest this before 6pm training. This could cause Alex to suffer from stomach cramps as he has left it too late for his food to be absorbed and digested

which usually takes 2-3 hours. This would have a decrease in his performance. Looking at his food preparation, Alex could avoid eating a chicken chow mein that is likely to have been fried because frying food makes it more fatty. He could instead stir fry the chicken chow mein to optimise the nutrients available in the food.

This response receive 20/20 marks.

The response includes correct BMR calculations with additional calorie intake related to activity levels has been provided. This has then been related to the energy intake shown on the nutritional programme and the negative effect a reduced calorie intake could have in relation to a lack of energy for training. Each macronutrient has been interpreted in relation to what the recommended percentage is and this has been related to his actual intake and the function of each macronutrient.

Links to health and wellbeing have been provided for each macronutrient.

Fluid intake has been interpreted and links to timings of intake have also been provided. Minimal reference has been provided however related to digestion and absorption of nutrients. However, due to the in-depth interpretation of other areas

of content this compensates for the reduced information related to digestion and absorption in the response.

This response was placed in Band 2: and awarded 6 marks out of 20

Health and wellbeing is the recommended diet we should be consuming. Moreover it should consists of 55% carbohydrates 15% Protein and 30% Fat. The eat well guide shows what food and drinks we should consume and it also gives the proportions in order to obtain a healthy lifestyle. In addition, A ~~balanced~~ balanced diet is the intake for health and wellbeing. It provides the correct amount of the 7 components within the eat well plate.

Alex's BMI is 23.4 which according to the BMI table is healthy. Furthermore his BMR is 1910. BMI is ^a less reliable measurement because it doesn't take into account muscle. whereas, BIA takes muscle into account.

Carbohydrate is the main source of energy. moreover it is quickest absorbed into the blood stream. Alex consumes the most carbohydrates on the event day. because he has to make sure he has enough energy to last throughout the games.

Alex consumes the least carbohydrate on Monday which was 320g. Alex is consuming 64% carbohydrate which is higher than the recommended value for the average person.

Protein builds body tissue and repairs body tissue. Furthermore, Alex consumed the most protein on the event day as he has to make sure his body tissue has been repaired from training in order to have a successful performance. ~~Alex~~ However, Alex consumed the least Protein on ~~Monday~~ ^{Fri} which was 80g. Alex's average daily protein intake is 15% which is the same as the government recommended value for the average person.

Fat insulates the body and protects vital organs. In addition to this, Alex consumes the most fat on Saturday and Wednesday which ~~is~~ ^{was} 150g. However, Alex consumed the least fat on Monday which was 80g. Alex's average daily fat intake is 21% which is lower than the government recommended value for the average person.

The average fluid intake for Alex is between 45 and 46L of fluids per day which means he is higher than the government recommendation of 2.5l of fluid per day for males.

I do not notice anything strange about the breakfast choice, only that he is consistent on the type of foods he is eaten is the same each day. The quality of snacks is fine but there could be some replacements. The type of fluids Alex is drinking could be replaced and Alex consumes the most fluids on Wednesday, Friday and Saturday. Alex consumes high fluids and fat on Wednesday. On days where there are high carbohydrates consumed, it is refuelling the body ready for the event or next training day. On days where there are high protein consumed it is also helping the muscle grow and repair ready for the event or next training.

This response correctly identifies the recommended percentage of each macronutrient but there is no reference to the client's diet in relation to working out if they are eating these percentages. BMI and BMR has been worked out but no reference to what BMR means or how the calorie intake from the diet is related to this is given.

An attempt is then made to provide quantities of each macronutrient consumed by the client but these are mainly incorrect. Correct identification of the function of each macronutrient.

Very little interpretation has been provided, mainly stating key features about a good diet which can be taken directly from the research notes written after the pre-release material. Learners need to be able to demonstrate application of knowledge to a given diet rather than providing recall knowledge of nutrition to gain credit in the higher mark bands.

This response received 6 marks.

Activity 2

Nutritional strategies are provided in the unit content in learning Aim D. It is therefore expected that learners will select an appropriate strategy for the client based on their event.

For this activity, learner's needed to focus on basketball which is predominantly a strength related sport. The client was under consuming protein in their usual diet compared to RDA as well as requiring higher levels due to their sport. As the client also takes part in a great deal of sport and physical activity, strategies related to increasing carbohydrate intake would also gain credit as the nutritional programme showed that the client was underconsuming on most days. However, strategies related to carbohydrate loading would not gain credit as this is for continuous endurance events lasting 90 minutes or over such as marathon running and therefore were not credit worthy.

Some learners did struggle with this question and many provided daily modifications to improve the client's diet rather than summaries of overall modifications across the diet. The daily modifications often concentrated on reducing fat intake as this was noted as being too high. Many learners did also include an increase in protein intake but few were then able to go on to relate this to the sports event which is the focus of the question.

Some learners did provide calculations to recommend protein intake and carbohydrate intake based on the type of sport the client took part in. Supplements were often suggested such as protein shakes, powders, branched chain amino acids (BCAA) to increase protein intake.

Good responses to this question did discuss increase in protein intake strategies and increase in carbohydrate intake. Supported modifications were provided with reasoning for each modification related to the clients sporting event.

Learners responses were marked by awarding a mark in one of four grade bands:

Grade band 1: 1-5 marks

Grade band 2: 6-10 marks

Grade band 3: 11-15 marks

Grade band 4: 16-20 marks

This response was placed in Band 3: and awarded 16 marks out of 20

Alex is a basketball player approaching a competition phase. Alex generally needs to increase his carbohydrate and protein intake. As he is of a normal weight, Alex does not ^{necessarily} need to lose or gain weight. He just needs to increase his calorie intake to meet his TDEE and achieve his macronutrient TDEE. Alex should decrease his fat intake and aim to consume more saturated fats rather than unsaturated.

Firstly, Alex needs to increase his carbohydrate intake because he trains every day and requires large energy stores to maximise his performance. He should eat more complex carbohydrates, such as pasta, rice and bread as they are broken down slower. This means that they provide a slower release

of energy over a longer period of time. If Alex ate more complex carbohydrates he would have more energy stored as all carbohydrates consumed are converted to glucose for energy and any excess is stored.

~~Alex could look at implementing a weight gain strategy to~~

Alex could implement a weight gain strategy to gain more lean muscle. He should create a positive energy balance so he consumes more energy than he expends. To do this he needs to ensure he consumes for carbohydrates and proteins. As he already consumes a lot of fat, he should continue to try and decrease his fat intake.

Alex requires more protein as he exercises a lot. He needs this extra protein to aid his recovery from training and performance. As he is exercising a lot, Alex is breaking

down more muscle tissue and therefore needs more protein to repair ~~these~~ his muscles. Protein can be filling and so Alex could use protein supplements as he clearly struggles to meet his protein requirements from food. He can use protein shakes or protein powders and bars as all are quick and easy to access or prepare. This would probably be more convenient for Alex. Consuming more protein will also provide energy when carbohydrates are not available and preserve lean muscle tissue. If Alex did decide to increase his protein intake through food, he should aim to eat ~~the~~ foods such as eggs, meat, fish and dairy products to get those EAAs he needs in order to resynthesise non essential amino acids.

Alex could decrease his fat intake just to ensure he maintains a healthy well being. Rather than consuming cookies, biscuits, cakes, crisps

and doughnuts, Alex should try to eat ~~5~~ 5 fruit or vegetables a day. This is a recommendation of the eatwell guide in order to maintain good health and well being. Alex can still eat these types of food but should do so in moderation, this is to avoid significant weight gain. He consumes a lot of ~~2~~ unsaturated fat meaning the foods he eats contain more than one carbon atom without hydrogen ions attached leading to fatty acids being produced, making the food worse.

Looking at his food preparation Alex could make some changes to optimise his nutritional value. On ~~Thursday~~ ^{Thursday} he could grill his chicken, ~~eat~~ ^{steam} his rice and steam some vegetables on the side to make it overall a better meal in terms of nutrients. His chicken ~~is~~ chow mein on Wednesday even is likely to be fatty from being ~~fried~~ fried. Fried food becomes

fatty and can therefore lead to a raised cholesterol which is a negative effect on health and well being.

The response is relevant to the individuals sporting event and the justifications for the modifications are all related to increasing protein and carbohydrate intake.

Direct reference has been made to the clients sporting event and problems associated with not having enough carbohydrate or protein been provided. Suggested modifications for increasing protein and carbohydrate as well as reducing fat intake such as food preparation methods or changing the snacks consumed are realistic and have been explained and justified. Methods and reasoning as to why increasing carbohydrate and protein intake have been included as well as suitable supplements for increased protein intake together with links to the clients sporting event.

Other dietary modifications have also been discussed including increasing fruit and vegetable intake – this has been linked to health and well being, however, if there had been links to sports performance then this response would have gained more credit.

This response gained 4 marks out of 20.

A nutritional strategy that could be appropriate for Alex is Carb loading. Carb loading is used to ~~the~~ increase the ~~new~~ muscles capacity to store glycogen above normal level. It is useful for events lasting up to 90 mins. The amount of glycogen stored is related to carbs eaten ⁱⁿ diet and the level of intensity in training/competition. Carb loading would be useful to Alex as ⁱⁿ his competition he will play four 20 minute games and one 20 minute game for the final and carbohydrates are used for energy. In addition from Alex's ~~nutritional~~ ~~nutrition~~ nutritional programme he doesn't meet his RDA for carbohydrates.

The first area of his overall diet to modify is his breakfast. Alex's breakfast is very repetitive everyday he has the same thing frosted cereal, wholemeal bagel with chocolate spread and full fat milk. A high amount of fats are ~~consume~~ consumed in his breakfast. Butter is a saturated fat as it is generally solid at room temperature. Alex could replace this butter with a reduced fat butter. He can also replace the full fat milk ~~with~~ with skimmed milk. In his breakfast he should try to include more carbohydrates ~~to replace the~~ as he trains

he trains everyday.

~~Alex also~~

Alex also needs to include rest days as he trains everyday and he has a low consumption of protein compared to what he should be having.

Protein is essential for growth and repair and he does not give his muscles any time to ~~recovery~~ recover. He can increase his protein intake he can add more protein into his dinner for example instead of breaded chicken he can replace the chicken with fish which is a primary source of protein. By increasing protein intake he will allow muscle growth and give his muscles time to repair.

Another diet area Alex could change are his snacks throughout the day. He can replace the buttered whole meal toast with Apples Apples as they provide carbs which will give him energy in a healthier way and it will also ^{add} more fruit and veg to his diet which he is lacking as he should be ~~have~~ consuming 5 a day.

The nutritional strategy provided is carbohydrate loading which is not appropriate for a basketball player so no credit was given to this part of the response.

The response goes on to provide modifications to the diet but with no or very little reasoning as to why the modifications have been recommended.

The part of the response related to increasing protein intake does show application and reasoning together with an attempt to provide realistic suggestions on what the client could do in order to increase his protein intake – however, replacing fish with chicken does demonstrate a lack of understanding of food sources that contain protein.

Activity 3

In Activity 3 learners had to focus on Part B of the case study and recommend nutritional guidance for the individual in relation to the individual based on the phase of the event that the individual is taking part in.

The phase of the event is stated as 'during the event'. Additional information was provided to make it clear that this was on the day of the event and the event took place on a Saturday between 12 am and 6pm. Any information related to what the client consumed before or after the event was not given credit as the phase is during the event.

The part of the specification that this activity relates to is D3 – Nutritional intake during different phases of the event and related to the following content:

- Types of food to be consumed and timings:
- Fluid intake
- Supplements where appropriate.

For a full day basketball tournament, key areas learners were expected to write about included:

- Types of food to be consumed and timings
- Sports drinks
- Simple carbohydrates rather than complex carbohydrate to help prevent stomach cramps and nausea
- Add small amounts of protein reduce time to fatigue – ration 3:1 Carbs:protein
- 30-60 g CHO per hour to delay glycogen depletion
- Fluid intake
- Supplements – energy gels, glucose tablets, protein shake/powder

Learners responses were marked by awarding a mark in one of three grade bands:

Grade band 1: 1-3 marks

Grade band 2: 4-7 marks

Grade band 3: 8-10 marks

This response was placed in Band 3: and awarded 10 marks out of 10

Alex is currently in the during phase of his event. His basketball tournament takes place between 12pm and 6pm. His team is playing four games, all lasting 20 minutes. If they are a team that wins the most games, they will proceed to the final, giving them an extra game to play.

~~The~~ Basketball is of a high intensity and as it is an aerobic endurance high intensity sport, glycogen stores will reduce by 55% ~~per~~ every hour, meaning that after 2 hours, all of Alex's glycogen stores will be fully depleted. In between games, Alex will need to consume simple carbohydrates that are broken down quickly and provide a quick burst of energy. The simplest carbohydrate unit is a monosaccharide and the

most common source of this is glucose. Glucose is important as it is used to produce adenosine triphosphate (ATP) which is the compound required for muscle contraction.

Without glucose, Alex is likely to ~~suffer~~ suffer from nausea and stomach cramps. To prevent this he needs to consume carbohydrate gels, sweets, jelly beans, or energy bars to conserve his glycogen stores. Alex could also drink isotonic or hypertonic sports drinks which can replenish carbohydrate stores. Isotonic sports drinks are quickly absorbed into the bloodstream so will provide carbohydrates and also hydrate Alex.

Alex also needs to consume these foods, such as energy gels to maximise his glycogen synthesis. Glycogen synthesis is vital in controlling blood sugar and water balance. The body requires the blood sugar levels to be kept in narrow

limits which, occurs through glycogen synthesis. Glucagon is released as a result of a decrease in performance ~~to~~ glucose level and therefore promotes the conversion of glycogen to glucose to provide energy.

The anti-diuretic hormone (ADH) controls hormonal fluid balance. If Alex has more ADH he will be able to absorb more fluids. The hypothalamus relays a message to the pituitary gland to release ADH.

This response shows a clear understanding of the reasoning as to why carbohydrates should be consumed during the event due to the nature of the intensity of the sport and the length of time the glycogen stores would last when taking part in the sport.

The type of carbohydrate that is recommended has been fully explored and then a wide range of foods, supplements and sports drinks that contain simple carbohydrates have been provided. Links to digestion and absorption of these types of carbohydrates and fluids have also been provided. Hormones related to glycogen break down have also been discussed. An attempt at the link with ADH and fluid balance has also been provided.

Very few learners included any reference to key areas of the specification related to hormonal control of blood sugar and water balance – this is of particular relevance when considering control of blood sugar levels and choices of food or fluid intake for 'during the event' phase and would need to be included to gain full marks in this activity.

This response was placed in Band 1: and awarded 1 mark out of 10

For Alex to keep up and have enough energy during the event he would need to ensure he starts the event full hydrated and ensure he remains hydrated during the full 20 minutes of the 4 games.

During the event he should try keep his self hydrated using sports drinks. This would prevent him from dehydrating while also producing sodium which help prevent muscle cramps. He also should drink to replace fluid lost through sweat. He should try not to consume ~~it~~ it too much.

The response is very brief indeed and gains credit for demonstrating some knowledge of the requirements related to hydration during an event.

Summary

Learners are encouraged to:

- Read and analyse the nutritional programme in relation to macro nutrient content. Percentage intake for each macronutrient should be assessed in relation to RDAs.
- Research any foods that are not familiar to find out the nutritional content and how food preparation may affect the nutritional composition of foods.
- Be prepared to carry out calculations in part B in relation to BMI and BMR of the client and use this information in the activities to justify the interpretation of nutritional programme and modifications.
- When answering questions refer to the nutritional programme and individual as much as possible and make sure that the content you refer to is actually in the case study
- Use the assessment criteria in the mark scheme for each activity to guide them and ensure they cover all the content needed for each activity.

For more information on Edexcel qualifications, please visit www.edexcel.com/quals

Pearson Education Limited. Registered company number 872828 with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

