



Rewarding Learning

# eGUIDE//

## Health and Social Care

### Unit A2 7: Human Nutrition and Health

Content	Page
<a href="#">Introduction</a>	3
<a href="#">Nutrients in food</a>	4
<a href="#">The dietary functions and sources of protein, carbohydrate and fats</a>	4
<a href="#">The dietary functions and sources of water soluble vitamins and fat soluble minerals</a>	6
<a href="#">The dietary functions and sources of minerals</a>	7
<a href="#">The importance of water and fluid intake and its application to individuals at different life stages</a>	8
<a href="#">The importance of non-starch polysaccharide (NSP) or dietary fibre and its application to individuals at different life stages</a>	8
<a href="#">Current dietary guidelines</a>	9
<a href="#">Exploring dietary health</a>	10
<a href="#">Infants</a>	10
<a href="#">Children</a>	10
<a href="#">Adolescents</a>	10
<a href="#">Adults</a>	12
<a href="#">Women</a>	12
<a href="#">Older People</a>	13
<a href="#">How a vegan diet can meet nutritional requirements</a>	14
<a href="#">Energy requirements</a>	16
<a href="#">Modification of recipes and diets to meet current dietary advice for those with food intolerance or allergies</a>	16



<u>Diet related conditions or disorders</u>	18
<u>Bowel cancer</u>	18
<u>Cardiovascular disease</u>	18
<u>Hypertension</u>	19
<u>Diabetes</u>	20
<u>Irritable Bowel Syndrome</u>	21
<u>Obesity</u>	21
<u>Osteoporosis</u>	22
<u>Stroke</u>	22
<u>Factors influencing dietary intake</u>	23
<u>Food preparation and handling</u>	24
<u>Bacteria relating to food poisoning</u>	26
<u>Factors affecting the growth of bacteria and high risk foods</u>	26
<u>Signs and symptoms of food poisoning and the individuals most at risk</u>	26
<u>Current legislation and regulations that apply to food storage and preparation</u>	27



## Introduction

This unit enables students to explore the relationship between nutrition and health. The unit explores the composition of food and the dietary needs of individuals in a range of settings. Students investigate the importance of a balanced diet and the impact food choices have on individuals' health and well-being. Students explore key factors influencing food choice and also examine the hygienic preparation of food.

Students apply their underpinning knowledge to the diets of individuals in a range of care settings.

Assessment for this unit consists of a two hour written examination that includes both short and extended responses.



## Nutrients in food

### The dietary functions and sources of protein, carbohydrate and fats

Nutrient	Function	Sources
Protein	<ul style="list-style-type: none"><li>vital in the maintenance of body tissue, including development and repair</li><li>a source of energy</li><li>involved in the creation of some hormones. These substances help control body functions that involve the interaction of several organs.</li><li>enzymes are proteins that increase the rate of chemical reactions in the body</li><li>a major element in transportation of certain molecules. For example, hemoglobin is a protein that transports oxygen throughout the body.</li><li>forms antibodies that help prevent infection, illness and disease. These proteins identify and assist in destroying antigens such as bacteria and viruses</li></ul>	<ul style="list-style-type: none"><li>Eggs</li><li>Milk</li><li>Yoghurt</li><li>Fish and Seafood</li><li>Soya</li><li>Nuts</li><li>Meat</li><li>Poultry</li></ul>
Carbohydrate	<ul style="list-style-type: none"><li>the primary function of carbohydrates is to provide energy for the body, especially the brain and the nervous system. An enzyme called amylase helps break down carbohydrates into glucose (blood sugar), which is used for energy by the body.</li><li>provides fuel for the central nervous system</li><li>enables fat metabolism</li><li>prevents protein from being used as energy.</li><li>is the preferred source of energy or fuel for muscle contraction and biologic work</li></ul>	<p>Starch:</p> <ul style="list-style-type: none"><li>potatoes,</li><li>bread,</li><li>cereals,</li><li>rice</li><li>pasta</li></ul> <p>Sugar:</p> <ul style="list-style-type: none"><li>sweets,</li><li>cakes and biscuits, and</li><li>sugary drinks.</li></ul>
Fats	<ul style="list-style-type: none"><li>a backup energy source when carbohydrates are not available. Fat is a concentrated source of energy. One gram of fat has 9 calories, which is more than double the amount of calories from carbohydrates and protein</li><li>some types of vitamins rely on fat for absorption and storage. Vitamins A, D, E and K, called fat-soluble vitamins, cannot function without adequate daily fat intake. These vitamins are essential parts of the daily diet.</li><li>fat cells, stored in adipose tissue, insulate the body and help sustain a normal core body temperature</li></ul>	<ul style="list-style-type: none"><li>meat,</li><li>fish,</li><li>butter,</li><li>margarine,</li><li>cooking fats and oils,</li><li>milk and milk products: cream and cheese,</li><li>baked goods, i.e. pastries, cakes, biscuits and breads,</li><li>eggs,</li><li>poultry and game,</li><li>high fat snacks.</li></ul>

The following links and the tables below provide a summary of the three macro nutrients.

[www.nhs.uk/Livewell/Goodfood/Pages/eatwell-plate.aspx](http://www.nhs.uk/Livewell/Goodfood/Pages/eatwell-plate.aspx)

[www.nhs.uk/Livewell/Goodfood/Pages/starchy-foods.aspx](http://www.nhs.uk/Livewell/Goodfood/Pages/starchy-foods.aspx)

[www.nhs.uk/Livewell/Goodfood/Pages/sugars.aspx](http://www.nhs.uk/Livewell/Goodfood/Pages/sugars.aspx)

[www.nhs.uk/Livewell/Goodfood/Pages/Fat.aspx](http://www.nhs.uk/Livewell/Goodfood/Pages/Fat.aspx)



## Sample exam questions

- 1 Complete the table below to include two functions and a rich source of each of the nutrients.

Nutrient	Functions	A rich source
Carbohydrate	1	
	2	
Fats	1	
	2	
Protein	1	
	2	

2. Juno, aged 12, visits her grandmother Pauline every week and stays for lunch. Pauline always makes Juno's favourite pasta dish followed by a treat of sweets and a fizzy drink. This meal is comprised of carbohydrates, both starch and sugars. Describe how these two types of carbohydrates may affect Juno's health. (2x3)

Starch

Sugars



## The dietary functions and sources of water soluble vitamins (B1, B12 and C) and fat soluble vitamins (A, D E and K).

[www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-B.aspx](http://www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-B.aspx)

[www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-C.aspx](http://www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-C.aspx)

[www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-E.aspx](http://www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-E.aspx)

[www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-K.aspx](http://www.nhs.uk/Conditions/vitamins-minerals/Pages/Vitamin-K.aspx)

Vitamin	Function	Sources
B1 (thiamine)	<ul style="list-style-type: none"> <li>working with other B-group vitamins to help break down and release energy from food</li> <li>keeping the nervous system healthy</li> </ul>	<ul style="list-style-type: none"> <li>vegetables – such as peas</li> <li>fresh and dried fruit</li> <li>eggs</li> <li>wholegrain breads</li> <li>some fortified breakfast cereals</li> <li>liver</li> </ul>
B12	<ul style="list-style-type: none"> <li>making red blood cells and keeping the nervous system healthy</li> <li>releasing energy from the food we eat</li> <li>processing folic acid</li> </ul> <p>A lack of vitamin B12 could lead to vitamin B12 deficiency anaemia.</p>	<ul style="list-style-type: none"> <li>meat</li> <li>salmon</li> <li>cod</li> <li>milk</li> <li>cheese</li> <li>eggs</li> <li>some fortified breakfast cereals</li> </ul>
C	<ul style="list-style-type: none"> <li>maintains the body's connective tissue</li> <li>is vital for wound healing</li> <li>aids the absorption of iron</li> <li>has antioxidant properties</li> </ul>	<ul style="list-style-type: none"> <li>oranges and orange juice</li> <li>red and green peppers</li> <li>strawberries</li> <li>blackcurrants</li> <li>broccoli</li> <li>brussels sprouts</li> <li>potatoes</li> </ul>
A	<ul style="list-style-type: none"> <li>retinol is required for good night vision and healthy skin and tissue.</li> <li>beta carotene is an antioxidant and may help the body to defend against cancer</li> </ul>	<ul style="list-style-type: none"> <li>cheese</li> <li>eggs</li> <li>oily fish</li> <li>fortified low-fat spreads</li> <li>milk and</li> <li>yoghurt</li> </ul>
D	<ul style="list-style-type: none"> <li>absorption of calcium</li> <li>formation and development of teeth and bones</li> <li>uptake of calcium and phosphorous by the bones and teeth.</li> </ul>	<ul style="list-style-type: none"> <li>milk,</li> <li>cheese,</li> <li>yogurt,</li> <li>sunlight,</li> <li>egg yolk,</li> <li>liver,</li> <li>oily fish,</li> <li>fish liver oil,</li> <li>margarine,</li> <li>butter,</li> <li>fortified cereals</li> </ul>
E	<ul style="list-style-type: none"> <li>helps to maintain healthy skin, eyes</li> <li>strengthens the immune system.</li> </ul>	<ul style="list-style-type: none"> <li>soya,</li> <li>corn</li> <li>olive oil</li> <li>nuts and seeds</li> <li>wheat germ – found in cereals and cereal products</li> </ul>
K	<ul style="list-style-type: none"> <li>needed for blood clotting, which means it helps wounds to heal properly.</li> </ul> <p>There is some evidence that vitamin K is also needed to help keep bones healthy.</p>	<ul style="list-style-type: none"> <li>green leafy vegetables – such as broccoli and spinach</li> <li>vegetable oils</li> <li>cereal grains</li> </ul>



## Sample exam questions

Analyse the functions of the fat soluble vitamins A, D, E and K in the diet. (12 marks)

### The dietary functions and sources of minerals (calcium, fluorine and iron).

Minerals	Functions	Sources
Calcium	<ul style="list-style-type: none"><li>• helps to build strong bones and teeth</li><li>• regulates muscle contractions, including heartbeat</li><li>• ensures that blood clots normally</li></ul>	<ul style="list-style-type: none"><li>• milk,</li><li>• cheese and other dairy foods</li><li>• green leafy vegetables – such as broccoli, cabbage and okra, but not spinach</li><li>• soya beans</li><li>• tofu</li><li>• soya drinks with added calcium</li><li>• nuts</li><li>• bread and anything made with fortified flour</li></ul>
Flourine	<ul style="list-style-type: none"><li>• involved in the formation of bones and teeth/ maintains bone structure</li><li>• helps to make teeth resistant to tooth decay</li></ul>	<ul style="list-style-type: none"><li>• fluoride toothpaste,</li><li>• drinking water and</li><li>• seafood,</li><li>• breast and milk formula</li><li>• dairy products</li><li>• tea,</li><li>• fluoride mouthwash</li><li>• gelatine</li></ul>
Iron	<ul style="list-style-type: none"><li>• helps to make red blood cells, which carry oxygen around the body. A lack of iron can lead to iron deficiency anaemia</li></ul>	<ul style="list-style-type: none"><li>• liver</li><li>• meat</li><li>• beans</li><li>• nuts</li><li>• dried fruit – such as dried apricots</li><li>• wholegrains – such as brown rice</li><li>• fortified breakfast cereals</li><li>• soybean flour</li><li>• most dark-green leafy vegetables – such as watercress and curly kale</li></ul>

### Activities

(i) Outline the importance of iron in the diet (3 marks)

(ii) Access the following link and make notes to assess the importance of vitamins for children

<http://www.nhs.uk/Conditions/pregnancy-and-baby/Pages/vitamins-for-children.aspx>



## **The importance of water and fluid intake and its application to individuals at different life stages.**

Water/fluid intake is important as it:

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

## **Sample Exam Question**

Assess the importance of fluid intake for older people in a care home. (9 marks).

### **The importance of non-starch polysaccharide (NSP) or dietary fibre and its application to individuals at different life stages:**

NSP is important in the diet as it:

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

### **Activity**

Access the following web site and make notes on “Why fibre is important”  
<http://www.nhs.uk/chq/pages/1141.aspx?categoryid=51>





## Current dietary guidance

Current guidance generated by a range of government bodies:

Demonstrate knowledge and understanding of the current guidance generated by a range of government bodies:

- Department of Health (DoH); Food First Advice Leaflet for Community Settings and Food First Advice Leaflet for Care Homes;
- Department of Education Northern Ireland (DENI); Food in Schools Policy – Healthy Food For Healthy Outcomes;
- Public Health Agency (PHA); Enjoy healthy eating;

### Activity

Make notes on the dietary advice generated by the above government bodies.



## Exploring dietary health

The nutritional requirements of individuals at each stage of life:

### Infants

The websites below provide detailed information.

<https://www.nutrition.org.uk/nutritionscience/life/infant-nutrition.html>

<http://www.nhs.uk/conditions/pregnancy-and-baby/pages/understanding-food-groups.aspx>

### Key points

Breastfeeding is the optimal method of infant feeding and exclusive breastfeeding is recommended for the first 6 months to ensure babies have the best start in life.

By around 6 months of age, breast or formula milk alone will no longer be sufficient to meet a baby's nutritional needs and the process of weaning onto solid foods should begin. The timing of the introduction of solids should take into consideration the individual baby's development as this can vary widely.

Fruit, vegetables and non-wheat cereals are suitable first weaning foods; the amount and variety of foods should gradually be increased to include other types of cereals, dairy foods, meat, fish, eggs and pulses.

From the age of 6 months, infants receiving breast milk as their main drink should be given a supplement (in the form of liquid drops) providing vitamins A, C and D.

### Children

#### Activity

Use the headings below make notes on the nutritional requirements of children (include why children need the nutrient and the main sources of that nutrient).

<https://www.nutrition.org.uk/healthyliving/lifestages/children.html?limit=1&start=1> is a useful website.

- carbohydrates
- protein
- fat
- calcium
- iron
- vitamin A
- vitamin C
- vitamin D

### Adolescents

#### Activity

Access the following link and make notes on nutritional needs of adolescents.

<http://www.nhs.uk/Livewell/Goodfood/Pages/healthy-eating-teens.aspx>



## Nutritional needs

The energy needs of adolescents are influenced by activity level, basal metabolic rate, and increased requirements to support pubertal growth and development. Adolescents need additional energy for growth and activity. Adolescent girls need approximately 2,200 calories each day. This is a significant increase from childhood requirements. To meet these calorie needs, adolescents should choose a variety of healthy foods, such as lean protein sources, low-fat dairy products, whole grains, fruits, and vegetables.

- fat: during adolescence dietary fat continues to play an important role as an energy source
- protein needs of adolescents are determined by the amount of protein required for maintenance of existing lean body mass and the development of additional lean body mass during the adolescent growth spurt. Adolescents need between 45 and 60 grams of protein each day
- calcium: it is estimated 45% of peak bone mass is attained during adolescence and so adequate calcium intake is important for the development of dense bone mass and the reduction of the risk of fractures and osteoporosis in women in later life
- iron is vital for transporting oxygen in the bloodstream. A deficiency of iron causes anaemia. With the onset of adolescence, the need for iron increases as direct consequence of rapid growth and the expansion of blood volume and muscle mass. As adolescents gain muscle mass, more iron is needed to help their new muscle cells obtain oxygen for energy. The onset of menstruation imposes additional iron needs for girls. The Recommended Dietary Allowance (RDA) for iron is 12–15 milligrams (mg) per day
- zinc is important in adolescent girls because of its role in growth and sexual maturation
- folate plays an integral role in DNA, RNA and protein synthesis. Thus, adolescent girls have increased requirements for folate during puberty
- vitamin C aids the absorption of non-haem iron and helps prevent anaemia from occurring
- carbohydrates: as teenagers have increased energy requirements, these can met by carbohydrates. These should be obtained from starchy, high-fibre, wholegrain cereals and not from the rapidly absorbed, refined cereals and sugary foods. Starchy carbohydrates are usually foods with a lower glycaemic index (GI) and these will help maintain blood sugar levels. Starch in the diet can help cut down on the amount of fatty foods that adolescents may include in their diet. Starch in foods can help fill them up and keep them feeling fuller for longer, therefore adolescents are less likely to eat high fat snacks such as fast food, doughnuts and crisps. Starchy foods, higher in fibre/NSP promote bowel regularity and keep the gastrointestinal tract clean to help reduce the risk of developing and constipation. A high fibre diet may also reduce the risk of developing Type 2 diabetes. Carbohydrate acts as a protein sparer so that protein will be used for its primary function which is growth and may also reduce cholesterol levels. Sugars are the main dietary component associated with dental caries. If adolescents eat too much sugar, this will have a negative impact on oral health as the greater the time during which the tooth is exposed to the low pH (acid) levels at which demineralisation occurs. Diets high in sugar can increase the risk of Type 2 Diabetes in later years and increases blood pressure, heart disease, stroke and kidney disease. Sugars can also impact on weight control, if they are not burned off as energy, the sugars will be stored as fat and contribute to obesity.



## Adults

### Activity

Access the following sites and make notes on nutritional needs of adults.

<http://www.nhs.uk/Livewell/Goodfood/Pages/the-eatwell-guide.aspx>

<https://www.nutrition.org.uk/nutritionscience/life/adults.html>

### Key points

Within a healthy, balanced diet, a man needs around 10,500kJ (2,500Kcal) a day to maintain his weight. For a woman, that figure is around 8,400kJ (2,000Kcal) a day. These values can vary depending on age, metabolism and levels of physical activity, among other things.

Requirements for energy and nutrients do not change greatly between the ages of 19 and 50 years, except during pregnancy or lactation, but do vary according to gender and activity levels.

In England, 41% of men and 33% of women are overweight (a BMI of 25-30 kg/m<sup>2</sup>), and an additional 26% of men and 24% of women are obese (a BMI of more than 30 kg/m<sup>2</sup>), according to Department of Health's Health Survey for England 2013.

On average, the diet of UK adults provides more than enough of most nutrients, but intakes of some vitamins and minerals have been shown to be low in some age/sex groups, for example iron in young women.

The percentage of energy derived from saturated fatty acids is higher than recommended (although total fat intake is close to recommendations), and the average diet contains too little fibre and too much salt. Average intake of free sugars is also higher than the target.

Several nutrients may be of particular importance for women's health including iron, calcium and folate. Nutrients of particular relevance for men include selenium and lycopene, which may play role in protecting against prostate cancer.

### Women

- after teenage years energy requirements are likely to be less and start to decline as women age
- energy intake is approx. 1940 calories. Women should adjust their overall intake of food according to the level of physical activity and make sure that their diet remains balanced. It is important that women continue to eat a healthy diet as they get older. Eating more than the body needs will lead to weight gain. Carrying excess weight increases the risk of developing heart disease, diabetes and breast and endometrial cancer. Severe obesity can cause bone and joint problems, as carrying the excess weight can place immense strain on joints such as the knees
- calcium intake reduced to 700 mg
- iron intake of 14.8 mg remains the same as adolescent girls up to the onset of menopause when it decreases
- zinc intake remains the same
- pregnancy and lactation: 200 Kcal energy intake increase and 6 g protein & 10 mg vitamin D increase



- no routine increase in mineral intakes are considered necessary during pregnancy with the exception of iron which may be taken in the last trimester
- folic acid supplements in pre conception and in early pregnancy reduce the risk of neuro tube defects( NTDs)

## Sample exam question

Explain three ways the food group 'potatoes, bread, rice, pasta and other starchy foods' meets the nutritional needs of adults.(3x2)

### Older people

Advice on weight maintenance in older people can be accessed from

<http://www.nhs.uk/Livewell/over60s/Pages/Underweightover60.aspx>

Some important points regarding the nutrition of older people;

- in the UK, life expectancy has doubled over the last 200 years and now around 16% of the population is aged over 65 years
- general nutrient requirements and healthy eating guidelines apply to older people. However, energy requirements fall with advancing age due to a decrease in basal metabolic rate and often decreased levels of physical activity
- the ability to synthesise vitamin D by the skin decreases with age. Older people are therefore recommended to take a supplement containing vitamin D daily as well as regularly eating food sources of the vitamin (for example oily fish and fortified breakfast cereals)
- some older people in the UK, especially those living in institutions, have been found to have low intakes and/or low blood levels of a range of micronutrients
- good nutrition and regular physical activity play a protective role in a number of age-related conditions including cardiovascular disease, cognitive decline, can help to protect oral and dental health, and bone and joint health in later life
- both malnutrition and obesity are prevalent in the older population. Malnutrition is more prevalent in older people living in institutions, whereas overweight and obesity are more prevalent in free-living adults

### Nutritional requirements of older people

- diet should be high in calcium and vitamin D to help prevent decalcification of bones and teeth
- protein is important to maintain and renew cells
- protein requirements may also be increased in some older people due to illness
- omega 3 – fatty acids found in fish oils help promote eye, heart and brain health
- fibre/NSP levels need to increase to prevent constipation caused by the slowing of the digestive system and reduced mobility
- iron is required to prevent anaemia, formation of red blood cells and transport of oxygen to tissue
- important need at this stage in life cycle for nutrient dense foods
- older people need a regular frequent intake of small portions of food
- vitamin A needed for maintenance of mucous membranes and eyes adaptation to light; antioxidant may help prevent cancers, cataracts and heart disease
- vitamin C, assists absorption of iron, anti-oxidant action, promotes good wound healing
- carbohydrate need reduced due to changes in energy requirements



- vitamin E Important role as an anti-oxidant. Vitamin E protects lipids against free radical change which means that cell membranes can be damaged leading to increased risk of inflammatory diseases such as rheumatoid arthritis. Free radicals can cause other damage, therefore vitamin E is thought to give some protection against some forms of cancer
- thiamine, older people require this for the release of energy within the body
- vitamin B12 – required in older people to work with folic acid for red blood cell formation
- a sufficient intake of fluids is necessary to keep the body hydrate

There is a slight deviation in the nutritional requirements of older women. Older women should make sure to get enough calcium and vitamin D as osteoporosis can affect older women after the menopause. This is where bone density reduces and the risk of fractures increases. Iron needs are reduced because menstruation has ceased. Housebound elderly women should take Vitamin D supplements or ensure safe exposure to summer sunlight.

## Sample exam question

Analyse the nutritional needs of older people. (12 marks)

### **How a vegan diet can meet nutritional requirements.**

A vegan diet contains only plants such as vegetables, grains, nuts and fruits and foods made from plants. Vegans don't eat foods that come from animals, including dairy products and eggs. A healthy vegan diet contains:

- plenty of fruit and vegetables
- plenty of starchy foods
- some non-dairy sources of protein, such as beans and pulses.

### **Protein**

Vegans eat no animal products so their dietary sources of protein are low biological value, missing some of the essential amino acids. Therefore it is important for vegans to eat a wide variety of pulses, cereals, seeds and nuts to meet the need for growth, particularly important during periods of rapid growth such as childhood and adolescence.

### **Calcium**

Calcium intake may be a problem in vegan diets as they do not consume milk or other dairy products and this would be a particular problem in childhood when calcium is required for the development of teeth and bones.

### **Vitamin B12**

Vegan diets may lack this vitamin as it is only found in foods of animal origin and this may lead to pernicious anaemia, most common in middle aged or elderly vegans. Supplements may be taken.



## **Iron**

Vegans are more susceptible to lower iron levels than non-vegetarians as the non-haem iron found in plant sources is poorly absorbed by the body, so vegans need to eat plenty of iron rich vegetables in conjunction with vitamin C to aid its absorption. This is particularly important for menstruating females.

## **Vitamins A, C and E**

Vegans tend to eat lots of fruit and vegetables which contain these vitamins which have anti-oxidant properties and so reduce the risk of some cancers including mouth, throat (larynx and pharynx), stomach and lung cancers.

## **Vitamin D**

This is not naturally present in vegetable foods, so vegans will need to eat fortified foods such as cereals or margarine.

## **NSP**

Vegans also consume foods high in NSP which supplies the body with a rich source of soluble and insoluble fibre. This is known to play a part in reducing the risk of bowel cancer as it adds bulk to waste therefore the body excretes waste quicker reducing the risk of a build-up of toxins that may cause intestinal disease such as cancer. For children, however, high levels of NSP may reduce the absorption of vital nutrients.

## **Fat**

Vegans consume foods with less saturated fatty acids and therefore cholesterol levels tend to be lower in the body. The foods vegans tend to consume are high in monosaturates and polyunsaturates which are associated with reducing cholesterol levels. These establish the long chain omega-3 fatty acids present in oily fish which help protect the heart. Vegans consume more quorn, soya and cereal products which are also low fat. These foods are also lower in salt which is a known risk factor of CHD as salt can cause hyper tension. Eating wholegrain and high-fibre products that contain soluble fibre is known to help to reduce blood cholesterol levels.

## **Low GI foods**

Vegans eat more fruit and vegetables every day, and these have the added benefit of releasing energy slowly which is thought to be good for the heart.

See the Eatwell Guide for more information about a healthy diet. It applies to vegetarians, vegans, people of all ethnic origins and those who are a healthy weight for their height, as well as those who are overweight. The only group it is not suitable for is children under two years of age, because they have different needs.



## Sample exam question

It has been demonstrated that vegan diets can meet the nutritional needs of people of all ages. Evaluate this statement. (12 marks)

**How the following affect energy requirements.**

**Basal Metabolic Rate (BMR)** – the amount of energy (in the form of calories) that the body needs to function while resting for 24 hours is known as the basal metabolic rate, or BMR. This number of calories reflects how much energy the body requires to support vital body functions if, hypothetically, a person was resting in bed for an entire day.

**Age** – energy needs peak at about age 25 and then decline by about 2 percent every 10 years. So if you are 25 years old and need 2,200 calories to maintain your weight, you will need only 2,156 by the time you are 35; 2,113 at age 45; 2,071 at age 55; and so on.

**Gender** – an adult man has less body fat and about 10 to 20 percent more muscle than a woman of the same size and age. As muscle burns more calories than fat does, a man's calorie needs are generally about 5 to 10 percent higher than a woman's. The exception for women is during pregnancy and breast-feeding.

**State of health** – nutritional requirements vary depending on whether someone is healthy or ill. As diseases are unique so are the nutritional requirements needed whilst that person is ill. The same applies to psychological and emotional stress. When people are affected by stress their appetite is affected, this results in less intake of food which in turn results in less nutrients being absorbed.

**Physical activity levels (PALs)** – when active a person burns calories and if they burn (or expend) more calories than they eat, they lose weight. The kind of exercise chosen and how long and how intensely it is done, determines exactly how many calories will be burned.

## Sample exam question

Describe three factors that affect an individual's energy requirements.

**Modification of recipes and diets to meet current dietary advice and for those with food intolerance or allergies such as coeliac, lactose intolerance or peanut allergy.**

### Activities

(i) Access the following web sites and make notes on food intolerance or allergies:

<http://www.nhs.uk/conditions/Coeliac-disease/Pages/Introduction.aspx>

<http://www.nhs.uk/conditions/lactose-intolerance/pages/introduction.aspx>

<http://www.nhs.uk/conditions/food-allergy/pages/intro1.aspx>

(ii) Access <http://www.nhs.uk/change4life/Pages/meal-planner-recipe-finder.aspx> and create a range of meals for a day for children, adolescents and older people.





## Sample exam questions

Describe the advice a dietician may give to individuals suffering from the following:

- Lactose intolerance (3 marks)
- Coeliac disease (3 marks)



## Diet related conditions or disorders

### The dietary risk factors and appropriate advice to help manage:

#### **Bowel cancer**

##### *Dietary risk factors:*

Evidence shows that there is probably a link between eating red and processed meat, and the risk of bowel cancer.

##### *Dietary advice for managing bowel cancer:*

It is recommended to cut down to 70 grams of red or processed meat a day (the equivalent of about three thin-cut slices of roast beef, lamb or pork, where each slice is about the size of half a piece of sliced bread). Evidence consistently suggests that eating plenty of fibre can reduce the risk of bowel cancer. Diets high in fibre can help keep the bowel healthy and prevent constipation. Fibre-rich foods include wholegrain pasta, bread, breakfast cereals and rice. Pulses, fruit and vegetables are also good sources of fibre. Being a healthy weight can reduce your risk of developing bowel cancer. Ensuring there is enough fibre in the diet can significantly reduce the chances of developing constipation. We should aim to have at least 18g of fibre a day. It is important to drink plenty of fluids to avoid dehydration and steadily increase intake when exercising or when it is hot. The amount of caffeine, alcohol and fizzy drinks consumed should be reduced.

#### **Cardiovascular disease**

##### *Dietary risk factors:*

An unhealthy diet containing too much sugar can increase the chances of developing diabetes, which is proven to dramatically increase the chances of developing CHD. A high sodium intake is a known cause of hypertension which is a risk factor of coronary heart disease. Food containing saturated fats can increase the levels of “bad” cholesterol in the blood.

##### *Dietary advice for managing cardiovascular disease:*

Eat a healthy, balanced diet. A low-fat, high-fibre diet is recommended, which should include plenty of fresh fruit and vegetables (five/seven portions a day) and whole grains. Limit the amount of salt eaten to no more than 6g (0.2oz) a day. A balanced diet should still include unsaturated fats, which have been shown to increase levels of “good” cholesterol and help reduce any blockage in the arteries.

A diet high in monounsaturated fatty acids and low in saturated fats may protect against coronary heart disease, for example oleic acid from olive oil. Mediterranean diets show lower rates of developing coronary heart disease perhaps due to a large intake of fruit and vegetables. The substitution of saturated fats by MUFA's may result in a reduction of LDL cholesterol so people should increase consumption of polyunsaturated fats and n-3, for by example increasing intake of fish (oily). Salt intake should be reduced. Low fat dairy products, nuts, fruit and vegetables are known to help reduce high blood pressure and eating more foods containing potassium such as bananas and vegetables may be beneficial. Calcium is associated with a low risk of developing coronary heart disease as it binds dietary fats and stops their absorption therefore people should ensure their diet is rich in calcium foods but not solely from dairy sources as these can be high in fat. Alcohol should be consumed within safe limits and red wine contains anti-oxidants which are linked to positive heart health. NSP intake should increase (oats have been



shown to reduce serum cholesterol levels) by eating more cereals, beans, nuts, fruit, vegetables, seeds. Vitamin E found in vegetable oil, sunflower seeds and oil etc. is an anti-oxidant nutrient and can lower the risk of developing coronary heart disease. Fresh fruit and vegetables and starchy foods can be used in snacks, another method of reducing fat content in diet. Consuming the products that claim to lower cholesterol, for example Benecol may help reduce the risk of cardiovascular disease.

## **Hypertension**

### *Dietary risk factors:*

Too much salt (sodium) in the diet can cause the body to retain fluid, and also causes the arteries in the body to constrict. Both factors increase blood pressure. Potassium causes the smooth muscle cells in the arteries to relax, which lowers blood pressure. Potassium helps balance the amount of sodium in the cells, so a diet low in potassium may increase the risk of hypertension. Low vitamin D intake may also be a risk factor. Researchers think that vitamin D may affect an enzyme produced by the kidneys that affects blood pressure. More studies are necessary to determine vitamin D's exact role in high blood pressure. Drinking too much alcohol is another risk factor and having more than two drinks per day can cause hypertension, probably by activating the adrenergic nervous system, causing constriction of blood vessels and simultaneous increase in blood flow and heart rate.

### *Dietary advice for managing hypertension:*

Reducing the amount of salt in the diet, eating a healthy diet, reducing caffeine and alcohol intake may reduce the risk.



## Activity

Use the links to prepare a table to summarise the dietary risk factors and advice for managing the range of diet related conditions or disorders listed below.

Diet related condition or disorder	Dietary risk factors	Advice for managing the condition or disorder
Crohn's disease <a href="http://www.nhs.uk/conditions/Crohns-disease/Pages/Introduction.aspx">www.nhs.uk/conditions/Crohns-disease/Pages/Introduction.aspx</a>		
scurvy <a href="http://www.nhs.uk/conditions/Scurvy/Pages/Introduction.aspx">www.nhs.uk/conditions/Scurvy/Pages/Introduction.aspx</a>		
rickets <a href="http://www.nhs.uk/conditions/rickets/Pages/Introduction.aspx">www.nhs.uk/conditions/rickets/Pages/Introduction.aspx</a>		
night blindness <a href="http://www.healthline.com/health/vision-night-blindness">www.healthline.com/health/vision-night-blindness</a>		
anaemia <a href="http://www.nhs.uk/conditions/iron-deficiency-anaemia/">www.nhs.uk/conditions/iron-deficiency-anaemia/</a>		
dental caries <a href="http://www.nhs.uk/conditions/Dental-decay/Pages/Introduction.aspx">www.nhs.uk/conditions/Dental-decay/Pages/Introduction.aspx</a>		



## Sample exam question

Analyse how staff in a day nursery may help reduce risk of tooth decay in young children. (12 marks)

### Diabetes

The website below provide useful information

<http://www.nhs.uk/conditions/Diabetes-type2/Pages/Introduction.aspx>

Type 2 diabetes occurs when the body doesn't produce enough insulin to function properly, or the body's cells don't react to insulin. This is known as insulin resistance. A person is more likely to develop type 2 diabetes if they are overweight or obese (with a body mass index (BMI) of 30 or more).

*Dietary risk factors:*

The main dietary risk factor is eating an unhealthy diet.

*Dietary advice for managing diabetes:*

Access <https://www.diabetes.org.uk/Documents/Reports/nutritional-guidelines-2013-amendment-0413.pdf> and read the research undertaken on how diet may prevent type 2 diabetes.

Increase consumption of high fibre foods, such as wholegrain bread and cereals, beans and lentils, and fruit and vegetables especially those that are more slowly absorbed (have a lower glycaemia index). Good choices include pasta, basmati or easy cook rice, grainy breads such as granary, pumpernickel and rye, new potatoes, sweet potato and yam, porridge oats, and natural muesli. The whole-grain, high-fibre varieties of starchy foods are usually better options and will also help to maintain the health of the digestive system. Choose foods that are low in fat – replace butter, ghee and coconut oil with low fat spreads and vegetable oil. Choose skimmed and semi-skimmed milk, and low fat yoghurts. Eat fish and lean meat rather than fatty or processed meat, such as sausages and burgers and grill, bake, poach or steam food instead of frying or roasting it. Avoid high fat foods, such as mayonnaise, chips, crisps, pasties, poppadums and samosas. Eat fruit, unsalted nuts and low fat yoghurts as snacks instead of cakes, biscuits or crisps.

### Irritable bowel syndrome [IBS]

#### Activity

Visit the website below and make notes on the dietary risk factors and advice for managing IBS [www.nhs.uk/Conditions/Irritable-bowel-syndrome/Pages/Introduction.aspx](http://www.nhs.uk/Conditions/Irritable-bowel-syndrome/Pages/Introduction.aspx)

### Obesity

*Dietary risk factors:*

Eating large amounts of processed or fast food that are high in fat and sugar. Drinking too much alcohol as it contains a lot of calories, and people who drink heavily are often overweight. Eating out a lot as people may be tempted to also have a starter or dessert in a restaurant, and the food can have a high sugar and fat content. Eating larger portions



than needed and people may be encouraged to eat too much if friends or relatives are also eating large portions. Drinking too many sugary drinks including soft drinks and fruit juice. Comfort eating, perhaps a person is feeling depressed or has low self-esteem so they may eat to feel better.

*Dietary advice for managing obesity:*

Ensure that energy intake does not exceed level of energy output. Restrict the proportion of dietary energy that is derived from fat (in particular saturated fat), added sugar and alcohol to reduce the energy density of the diet. Swap these for starchy foods, for example potatoes, cereals, wholegrain as these are high in NSP which increase the satiation value. Eat more high fibre foods, for example, wholegrain/wholemeal bread and brown rice as these aid digestion. Increase the intake of fruit and vegetables these are low in calorific value. Use low fat alternatives, for example Quorn as it is low in fat and high in protein. Use cooking methods that reduce fat, for example grilling, steaming or poaching. Replace fizzy drinks with water and reduce alcohol intake. Reduce the intake of high sugar foods which provide empty calories, for example cakes and biscuits and eat breakfast and all main meals to prevent snacking. Control portion size.



## Sample exam question

Analyse how adults can reduce the risk of becoming obese by following a healthy diet (12 marks).

### **Osteoporosis**

Osteoporosis is a medical condition in which the bones become brittle.

#### **Activity**

Access [www.nhs.uk/conditions/Osteoporosis/Pages/Introduction.aspx](http://www.nhs.uk/conditions/Osteoporosis/Pages/Introduction.aspx) and make notes on osteoporosis using the headings below:

- *Dietary risk factors:*
- *Dietary advice for managing osteoporosis:*

### **Stroke**

A stroke is a disruption in the blood supply to the brain and most are caused by blockages, usually a clot.

#### **Activity**

Access the following website and make notes on the dietary risk factors and advice for managing stroke. [www.nhs.uk/conditions/Stroke/Pages/Introduction.aspx](http://www.nhs.uk/conditions/Stroke/Pages/Introduction.aspx)



## Factors influencing dietary intake

Assess how the following influence food choice:

- advertising;
- availability;
- religion, for example Jewish, Hindu and Muslim faiths;
- economic;
- knowledge;
- culture;
- psychological factors, for example coeliac, diabetes, obesity or coronary heart disease;
- physiological factors, and
- labelling.



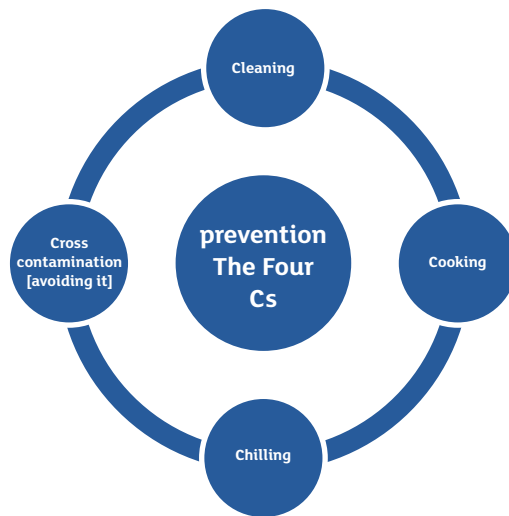


## Food preparation and handling

The importance of good hygiene and safe practices when storing and preparing food.

### Activity

Access the following website and make notes on preventing food poisoning  
<http://www.nhs.uk/Conditions/Food-poisoning/Pages/Prevention.aspx>



Additional reading around “the Four Cs” can be accessed from the following sites

Cleaning: <http://www.nidirect.gov.uk/keeping-your-kitchen-clean>

Cooking: <http://www.nidirect.gov.uk/cooking-food-properly>

Chilling: <http://www.food.gov.uk/safety-hygiene/chilling>

Cross contamination [avoiding it]

<http://www.medic8.com/healthguide/food-poisoning/cross-contamination.html>

Safe practices for staff involved in food storage and preparation in care settings:

#### *Wash hands*

Staff should wash their hands thoroughly with soap and hot water, and dry them before handling food, after handling raw foods including meat, fish, eggs and vegetables and after touching the bin, going to the toilet, blowing their nose, or touching animals, including pets.

#### *Wash worktops*

Staff should wash worktops before and after preparing food, particularly after they have been touched by raw meat, including poultry, raw eggs, fish and vegetables. Staff do not need to use antibacterial sprays as hot, soapy water is fine.

#### *Wash dishcloths*

Staff should wash dishcloths and tea towels regularly and let them dry before using them again. Dirty, damp cloths are the perfect place for bacteria to grow.



### *Use separate chopping boards*

Staff should use separate chopping boards for raw food and ready-to-eat food. Raw foods can contain harmful bacteria that spreads very easily to anything they touch, including other foods, worktops, chopping boards and knives.

### *Keep raw meat separate*

It's especially important to keep raw meat away from ready-to-eat foods, such as salad, fruit and bread. This is because these foods won't be cooked before being eaten so any bacteria that gets on to the foods won't be killed.

### *Store raw meat on the bottom shelf*

Staff should always cover raw meat and store it on the bottom shelf of the fridge, where it can't touch other foods or drip onto them.

### *Cook food thoroughly*

Staff should cook food thoroughly and check that it's steaming hot all the way through making sure poultry, pork, burgers, sausages and kebabs have no pink meat inside. They should not wash raw meat including chicken and turkey before cooking, as this risks spreading bacteria around the kitchen. Thoroughly cooking the meat will kill the bacteria. Keep the fridge below 5°C.

Staff should keep the fridge temperature below 5°C. By keeping food cold, staff will stop food poisoning bacteria growing.

### *Cool leftovers quickly*

If staff have cooked food that is not going to be eaten straight away they should cool it as quickly as possible (within 90 minutes) and store it in the fridge or freezer. Use any leftovers from the fridge within two days.

### *Respect 'use by' dates*

Staff should not use food that's past its 'use by' date even if it looks and smells okay. 'Use by' dates are based on scientific tests that show how quickly harmful bacteria can develop in the packaged food.



## Specific bacteria relating to food poisoning (salmonella, campylobacter, E.coli and staphylococcus aureus);

### Activities

- (i) Access the following website and make notes on the causes of food poisoning.  
[www.nhs.uk/conditions/Food-poisoning/Pages/Introduction.aspx](http://www.nhs.uk/conditions/Food-poisoning/Pages/Introduction.aspx)
- (ii) Complete the table below on bacteria relating to food poisoning.

Name of food poisoning bacteria	One symptom of food poisoning	One source of bacteria
Salmonella		
Campylobacter		
E. coli		
Staphylococcus aureus		

## Factors affecting the growth of bacteria and identify high risk foods.

### Factors

- warmth
- time
- food
- moisture
- favourable chemical environment
- oxygen

### High risk foods

- meat
- poultry
- eggs
- milk and cream dishes
- rice
- seafood
- reheated dishes
- pre-packed salads/vegetables

## Signs and symptoms of food poisoning and the individuals most at risk;

The main signs and symptoms include:

- feeling sick (nausea)
- vomiting
- diarrhoea, which may contain blood or mucus
- stomach cramps and abdominal (tummy) pain
- a lack of energy and weakness
- loss of appetite
- a high temperature (fever)



- aching muscles
- chills

Individuals who are particularly vulnerable to food poisoning include:  
Children, older people and those with weakened immune systems

## Activity

To prepare for the examination complete a table summary using the headings below:



Roles and responsibilities of the following in monitoring and enforcing food safety regulations:

- the Food Standards Agency; and
- the environmental Health Officer (EHO).



## Sample exam questions

- (i) Explain why each of the following is good practice when preparing food in a canteen.  
Tying back long hair and covering it with a protective cap. (2 marks)  
Removing rings from fingers and then washing hands. (2 marks)
- (ii) Temperature affects the growth of bacteria. Write down three other factors that affect the growth of bacteria. (3 marks)
- (iii) Using the following headings, outline the procedures which the canteen staff should follow to ensure optimum standards are maintained when storing food.  
Stock rotation (3 marks)  
Temperature control (3 marks)
- (iv) Name one high risk food likely to cause food poisoning. (1 mark)
- (v) Identify two groups of individuals who are particularly at risk from food poisoning. (2 marks)
- (vi) Analyse safe practice when using high risk foods. (12 marks)