

BANCHORY ACADEMY HOME ECONOMICS

UNIT 2



Name _____

Class _____

Unit 2

Outcomes and Experiences:

Health and well being 2.30a, 2.33a, 3.30a, 3.31a, 3.32a, 3.33a, 4.31a, 4.34a

Technologies 3.10a, 3.10b, 3.11a, 4.10b

The following topics will be covered by experiences within this unit

- Key nutrients
- The digestive system
- Nutritional needs across life stages/style
- Deficiency diseases caused by malnutrition.
- Recognition of nutritionally deficient menu and methods of rectify the deficiency
- Build confidence and dexterity in use of ingredients
- Application of food preparation skills

Controlled vegetable preparation: fine dice/slice

Accurate measurement

Good cooker control: grilling/simmering/rapid boiling

Judgement skills: seasoning
correct cookery of rice/pasta/potatoes

All-in-one sauce making

Preparation of baking tins

Nutrition

Nutrition is the science studying the relationship of food and the human body.

Food is defined by Nutritional scientists as: -

“any item that is consumed and absorbed by the body through the process of digestion.”

The body requires food in order to support and maintain life.

What are nutrients?

Food is broken down in the body into nutrients. The nutrients are protein, fat, carbohydrates, vitamins and minerals. All food contain at least one nutrient, most contain a complex blend of many nutrients.

We have reserves of most nutrients in our body in case of periods of illness, famine or other circumstance causing a lack of food.

Water

Water is not a nutrient but is required to support life. Water makes up approximately 70% of our body mass. It is used for all bodily functions and processes including

- Digestion – the breaking down of foods into nutrients, water and waste
- Respiration – breathing leading to absorption of oxygen into the blood system and emission of carbon dioxide
- Nervous system – allows electrical impulses to pass from the brain to muscles
- Removal of waste materials
- Temperature control

It is very important that the body's water balance is maintained; this is a function of the kidneys. We must make sure we are constantly replacing the amount of water the body is using – this is called **rehydration**.

When the body uses up water without us replacing it by drinking water is dehydration. The **symptoms** of **dehydration** include **headaches and dizziness**.



Discussion point

Why is it important to drink water during/after taking part in P.E. lessons or other sporting activities?

When are we at risk of becoming dehydrated?

Report of discussion:

Protein

Protein is important for

- Growing new body cells, (especially important for children and teenagers)
- Repairing body cells, tissues and muscles

We cannot store protein in our bodies so must eat it daily **but** if we eat more protein in a day than we need the excess is stored as fat. The amount of protein we need to eat varies according to age and lifestyle.

- 11-14 year old teenagers need 41.2 - 42.1g of protein per day
- Older Teenagers need 45 - 55.2g of protein per day

N.B. Proteins can be difficult for some people to access due to allergies/intolerance e.g. coeliac, lactose, egg.



Discussion point

Do you think your parents require the same amount of protein as you?

Where do we get proteins?

Animal foods and products such as beef; chicken, fish, eggs, milk, cheese etc. are classed as high biological value proteins or protein rich foods.

The only cereal/vegetable sources of high biological value are soya beans, TVP and tofu.

Cereals and vegetables such as bread, flour, peas, beans and lentils are classed as lower biological value foods and are generally eaten in combinations to give high value e.g. beans and toast.

Using 'Food Tables & Labelling' books page 30 onwards complete the table below.

Protein content in grams per 100g

Brown toast	10.4g	Egg
Roast beef sirlion		Boiled macaroni
White bread		Cottage cheese
Peanuts /monkey nuts		Baked potatoes
Semi skimmed milk		Boiled white rice
Oatcakes		Rice krispies

When using food tables we can easily calculate the percentage of any nutrient – protein, fat, vitamins, e.g. brown toast contains 10.4% of protein and 0% vitamin A.



1. Look at the packed lunch below and using the 'Food Tables & Labelling' books calculate the protein content of the foods.

Lunch foods	Serving size	Amount of protein in serving in grams
Roast chicken meat only	100g	
Carrots	100g	
Roast potatoes	150g	
Low fat fruit yogurt	50g	
Total protein eaten		

2. Calculate the grams of protein required in the rest of the day's meals to meet the protein needs for an 11-14 year old.

3. Give suggestions of foods containing protein that could be eaten at breakfast time. (use food magazines to help you)



Discussion point (make notes as you discuss)

What foods have you eaten today that provides you with protein?

Are they high or low biological value?

Use 'Food Tables & Labelling' books to help you.

FAT

The body for uses fats for:

- Energy (1 g of fat gives almost 2 x the energy of 1 g of protein or Carbohydrates.)
- Insulation, fat is found under the skin to prevent heat loss
- Providing essential fatty acids such as omega 3 and 6
- Providing vitamins A, D, E, and K

Where do we get fat?

Fats can be in 2 forms - saturated fats or unsaturated fats.

Saturated fats – these are usually solid at room temperature and mainly are from animal sources. They can be bad for your health if you eat too much of them. Examples of foods high in saturated fats include sausages, burgers, pies, cheese, cream and butter.

Saturated fats will in time build up cholesterol deposits in the arteries. This can cause problems for heart functions leading to heart disease.

We can help prevent heart disease by reducing the level of fats, especially saturated fat in the diet and getting plenty of exercise.

How can we tell if a food is high in saturated fat?

5g of saturated fat per 100g of food are classed as high.

1.5g of saturated fat per 100g of food are classed as low.

Unsaturated fats – these are usually liquid at room temperature and come from plant sources. They are less harmful to health. Examples of foods high in unsaturated fats are olive oil, rapeseed oil, sunflower oil, salmon, herring, nuts and seeds.



Discussion point (make notes from the discussion)

What types of fats are you using at home?

Are they mainly saturated or unsaturated?

Fats may be described as 'hidden' i.e. they are not seen and you may not be aware they are in the food. High hidden fat products are pastries, cakes, snacks and pizza.



A. Use the table below to answer the questions 1-3

Food	Fat in 100g	Saturated fat in 100g
Mayonnaise	83.4g	7g
Low fat mayonnaise	29.3g	4.4g
Biopot fruit yogurt	2.7g	1.7g
Low fat cream cheese	3.7g	2.4g
Sesame breadsticks	15.2g	2.7g
Breaded quorn fillets	10.0g	1.4g
Bread & butter pudding	16.1g	9.8g
Chicken tikka masala & rice	5.1g	1.3g

1. List the foods in order of their fat content – lowest (most healthy) to highest (least healthy).
2. Which foods have the highest saturated fat values?
3. Why is the light mayonnaise a better food choice than traditional mayonnaise?

B. Explain, with reasons, why many adults should reduce the fat in their diet.

C Describe 3 ways people could achieve a reduction in fat in their diet.

D Working with others at your table, collect 6 pieces of food packaging and place them in order with lowest first in each of the categories below

1. total fat
2. saturated fat
3. unsaturated fat

(you may need to carry out some calculation to find all the answers)

CARBOHYDRATE

Carbohydrates are used to provide the body with the energy we need for all our activities.

There are 2 types of carbohydrates.

- Starches
- Sugars

STARCHES

- maybe referred to as total complex carbohydrates (TCC)
- include bread, pasta, flour rice and breakfast cereal.
- good source of energy
- many starch foods contain fibre which helps to fill you up and prevents constipation.
- give a slow release of energy due to long digestive processing in the body
- starchy foods also are good sources of other nutrients such as protein, vitamins and minerals.
- do not cause tooth decay as the bacteria in the mouth cannot use starch to create harmful acids.

Starches are found in cereals, such as oats, rice, barley, wheat, fruits and vegetables such as bananas, potatoes, sweet potatoes and plantain.

Starch foods digest slowly in the digestive system, as these complex carbohydrates need to be broken down to simple forms to be absorbed by the body. (Complex carbohydrates will be broken down eventually to glucose and be absorbed into the blood stream.)

Many starch foods contain **fibre** - a form of starch that cannot be digested but aids the digestive system to work and helps to make us feel full for longer. These are found in the wholegrain forms of cereals such as wholemeal flours, brown rice etc.

SUGARS

- processed sugars are called empty calories as they only contain energy.
- give a quick release of energy (sugar rush) as quickly digested and passes into the blood stream.
- sugar is converted by bacteria in the mouth to acid which damages the teeth.
- natural sugars are found in all fruits, vegetables, cereal grains and milk.

Sucrose (processed sugar) – often described as empty calories as the processed sugar provides energy without other nutrients. Processed sugar is extracted from sugar beet or cane and used in many processed foods to help improve colour, taste and preservation. Examples of foods including hidden sugars are

Sugar has many names that are used by manufacturers to disguise the sugar in a product - glucose, dextrose

Sugar occurs naturally in milk, fruits and vegetables and all cereals. Each of these sugars has a specific name: lactose, fructose and maltose.



Discussion point

When is the best time to eat sweets or sugary drinks to help prevent tooth decay?



1. Use the table below to work out all the carbohydrate content of the foods

Food per 100g	Energy in kcal	Carbohydrate	Starch	Sugar
Pasta	355 kcal	72.3g		3.5g
Chicken jalfrezi	155 kcal		1.9g	3.0g
Ritz crackers	493 kcal	57.5g		6.6g
Fish pie	75 kcal	9.5g	8.1g	
Dark chocolate	500 kcal	52.5g	2g	
Lemon sponge	355 kcal		43.5g	14.9g

2. Potatoes were a very popular source of starch in the UK until the late 20th century.
List the foods that are now more commonly used as starch sources:



Discuss at your table the reasons why these starch sources are now more widely used. Summarise your discussion in a paragraph below:

3. Using the 'Food Tables & Labelling' books find the sugar and fibre values for 100g of the following fruits.

Fruit	Sugar per 100g	Fibre per 100g
Raspberries		
Banana		
Apple dessert		
Orange		
Pineapple		
Watermelon		
Kiwi		

Vitamins

Vitamins are essential for normal growth and health. They are named after letters of the alphabet - easier to remember than their chemical names. By eating a well balanced diet we can meet all the body's vitamin requirements.

There are 2 types of vitamins - **water**-soluble vitamins and **fat**-soluble vitamins.

Water-soluble vitamins - these vitamins need to be consumed daily as they cannot be stored in the body. The most important water-soluble vitamins are vitamins **B** and **C**.

	Uses in the body	Sources
Vitamin B group (B1, B2, Niacin, B6, Folate)	Helps release energy from carbohydrates. Promotes normal growth in children. Aids heart function, healthy blood, muscle function and well functioning nervous system.	Red meat, liver, fish, milk, fortified breakfast cereals, yeast extract (marmite), wholemeal/grain breads, cheese, green peas, eggs, potatoes.
Vitamin C	It is used to make the connective tissues that bind the body cells together. It helps the body to absorb iron. Assists with the building of strong bones and teeth. Required for healthy body tissues and skin. Aids with the healing of wounds Works in conjunction with vitamins A and E to help prevent cancer and heart disease. (ACE vitamins)	Blackcurrants, kiwis, Citrus fruits – oranges, limes, lemons, etc. 'dark green' vegetables – cabbage, broccoli, peas, cauliflower etc.

Using the 'Food Tables & Labelling' books, find the vitamin C content of following:
(100g weight)

Leeks	Melon (galia)	Grapes
Banana	Carrot	Brussels sprouts
Mushrooms	Limes	Peas
Apples	Blackcurrants	Oranges

Which is the richest source of vitamin C?

Using the 'Food Tables & Labelling' books, find the folate content of the following meat/fish.
(100g weight)

Roast Beef (sirloin)	Liver (ox)	Salmon
Haddock	Chicken(leg)	Kidney(pig)

Extension

Using the list of fruit and vegetables above, find the best source of vitamin B group.

Is there a group of the population who may struggle to access vitamin B group?

Fat-soluble vitamins - these vitamins can be stored in the liver so do not need to be consumed every day. Fat-soluble vitamins are found in foods containing fats. The most important fat soluble vitamins are A and D

	Uses in the body	Sources
Vitamin A	Helps normal growth in children. Required for vision, especially in poor light (night vision). Required for healthy skin. Keeps the mucous membranes in good condition. Increases resistance to infections. Works in conjunction with vitamins C and E to help prevent cancer and heart disease. (ACE vitamins)	Liver, butter, margarine, meats, eggs, oily fish, fish liver oils, cheese, Beta – carotene (converts into vitamin A in the body) Carrots, spinach, tomatoes, apricots, watercress
Vitamin D	Works with calcium and phosphorous to form healthy bones and teeth.	Oily fish, fish liver oils, egg yolk, liver, margarine, butter milk, cheese, fortified breakfast cereals. Vitamin D is absorbed by the body from sunlight.



Why is it important we source vitamin D from our food in Scotland?

Questions

1. Why must we eat foods rich in water soluble vitamins daily?
2. Which vitamins are water soluble?
3. Who may have a problem accessing vitamin B group through their diet?
4. Which vitamins work in conjunction with vitamin E to fight cancer and heart disease?
5. Which can be converted into vitamin A in the body?

Minerals

There are a number of minerals that are required by our bodies but most are in very small or “trace” amounts. It is important to eat a wide range of foods each day in order to make sure that we have a good supply of minerals.

Minerals	Uses in the body	Sources
Iron	Iron forms red blood cells (haemoglobin), which carry oxygen from the lungs to the muscles.	Red meats, kidney, liver, egg yolk, bread, breakfast cereals, lentils, dried fruits Cocoa, dark green leafy vegetables
Calcium	Calcium combines with phosphorus and vitamin D to make calcium phosphate to build our bones and teeth. Helps to cause blood to clot after injury. Helps to prevent brittle bones.	Milk, cheese, yoghurt, flour, white bread (required by law)
Phosphorus	Phosphorus combines with calcium and vitamin D to make calcium phosphate to build our bones and teeth.	Milk, butter, yoghurt, meats, fish
Fluoride	Hardens the enamel on teeth, helps to prevent tooth decay.	Water, tea, salt water fish
Sodium	Helps regulate the water level within cells. Helps regulate body temperature. Needed to allow nerves to function correctly. Aids muscle contraction. Too much sodium in the diet can be harmful to our health.	All vegetables, fruits, meats naturally contain sodium. Processed foods such as bacon, cheese, crisps, savoury snacks are high sources of sodium

Assessed homework

Produce a leaflet on the importance of vitamins and minerals for teenagers.

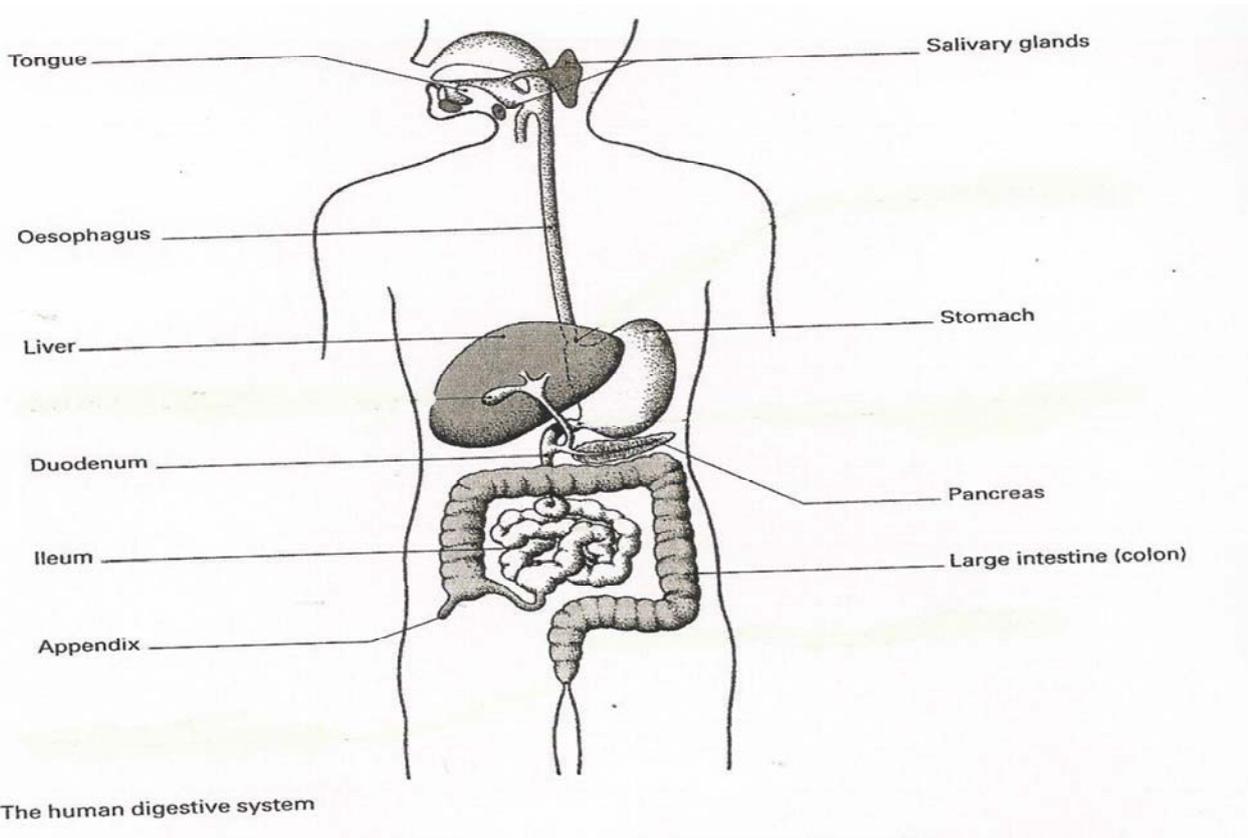
Your leaflet should be

- A4 in size
- Informative
- Appeal to teenagers
- Clearly laid out
- Colourful

Digestion

The foods are broken down into nutrients by the body's digestive system and the process begins before we actually eat. The sight, smell and even the thought of foods can stimulate our **salivary glands** into action producing saliva in readiness for the first bite of food. The chewing action of the **tongue** and teeth cause the food to mix fully with the saliva and break down the food into small pieces that travel down the oesophagus.

The **oesophagus** carries the food into the **stomach**. The stomach muscles help to mix food with gastric juices and break it down into a liquid to be slowly passed into the small intestine. (Gastric juices are very important as they help to kill harmful bacteria that may be eaten in foods.)



The **small intestine** is a long, thin tube, which allows the liquid food to mix with liquid from the **pancreas** and aids absorption of nutrients into the bloodstream. The process of food passing through the small intestine can take up to 4 hours.

The nutrient rich blood goes to the **liver** where harmful substances and waste are filtered out. The blood is then circulated around the body taking the nutrients to where they are required. Some of the nutrients maybe stored for future use e.g. vitamin A and energy in form of fat.

The waste from the digestive process travels through the **large intestine** before being excreted.

Energy

Energy is released during the digestive process from fats, proteins and carbohydrates. It is used by the body to:

- Maintain body temperature
- Carry out internal functions – heartbeat, digestion, breathing, thinking
- Carry out physical activities – walking, running, sitting

It is important to have our energy needs balanced:

Too much energy - extra gets converted to fat

Too little energy – body finds activities difficult – poor concentration, tiredness and inability to carry out physical activities as normal.

Energy is measured in calories (kcal) and in kilojoules (kJ), both appear on food labelling but generally the term calories is more widely used.



Do we all need the same amount of energy?

Factors Affecting Energy Requirements

Age – Children

Elderly

Gender –

Lifestyle – Work

Leisure

Other -

The body uses 50 calories per hour to support the body's essential functions – breathing, heart beat, etc. the more bodily functions and physical activity carries out the more calories are required.

Fran works in a local shop, she is aware she has problems with her weight - she has put on 5 stone since leaving school 2 years ago. She used to play badminton after school once a week and walk the family dog every morning before school. She no longer does either activity and spends most evenings on facebook or watching DVDs.

This is a typical working week's diet for Fran – at the weekend she tends to eat carry-outs with friends and usually misses breakfast.

	Breakfast	Lunch	Evening meal	Snacks
Monday	Can of red bull	White roll with butter and bacon, crisps, mars bar, water	Burger and chips, coke	Cappuccino, Slice of chocolate gateau
Tuesday	Bowl of coco-pops with semi-skimmed milk	Cappuccino, Danish pastry	Pepperoni pizza and chips. Slice of cheesecake, water.	Can of coke, bag of Doritos
Wednesday	2 butteries and jam, tea	Fruit salad	Chicken curry and chips, fruit yoghurt, water	None
Thursday	2 slices granary toast, butter and marmalade	Burger and white roll, can of red bull	Vegetable lasagne and chips, pear tart and ice-cream	Cappuccino, shortbread
Friday	Fried eggs on white toast	Large bag of crisps, can of coke	Shepherds pie, mug of hot chocolate	Bar of chocolate, Can of coke

Give Fran 5 pieces of advice as to how she could change her lifestyle to be more healthy.

- 1.
- 2.
- 3.
- 4.
- 5.