Food Preparation & Nutrition Knowledge Organiser: Food, Nutrition & Health

You must be able to demonstrate knowledge and understanding of the functions, structures and main sources of protein, carbohydrates and fat. Know the biological value of protein, understand an individuals need for carbohydrate, understand the consequences of excess and deficiencies of protein, carbohydrate and fat.
Demonstrate the knowledge and understanding of the sources and functions of vitamins and minerals. Understand the consequences and deficiencies of vitamins and minerals. Understand the retention of water soluble vitamins during cooking.
Demonstrate the knowledge of the Eatwell Guide and health eating guidelines. Understand diet requirements throughout life and diet related illnesses

Key words

1. Amino Acids
2. High Biological Value (HBV)
3. Low Biological Value (LBV)
4. Protein Complementation
5. Kwashiorkor
6. Fatty Acids
7. Glycerol
8. Saturated Fats
9. Unsaturated Fats
10. Fat Soluble vitamins
11. Water Soluble Vitamins
12. Cholesterol
13. Hydrogenation
14. Trans fats
15. Dietary Fibre
16. Photosynthesis
17. Monosaccharides
18. Disaccharides
19. Polysaccharides
20. Non starch Polysaccharide (NSP)
21. Constipation
22. Diverticular Disease

Keywords

1. Fortified
2. Rickets
3. Osteomalacia
4. Antioxidant
5. Thiamin
6. Riboflavin
7. Spina bifida
8. Ascorbic acid
9. Peak Bone Mass
10. Haemoglobin
11. Anaemia
12. Thyroid
13. Dehydration
14. Lactating

Keywords

1. Eatwell Guide
2. Puberty
3. Menstruation
4. Iron Deficiency anaemia
5. Osteoporosis
6. Foetus

Keywords

1. Basal Metabolic Rate (BMR)
2. Physical Activity Level (PAL)
3. Estimated Average Requirement (EARs)
4. Energy Density
5. Reference Intake (RI)
6. Body Mass Index

Key Points

1. Protein is required by the body for growth, maintenance and repair.
2. Proteins are built up of units of amino acids.
3. Fats can be classified as either saturated and unsaturated.
4. Saturated fats are considered to be more harmful to health because they raise levels of cholesterol.
5. Carbohydrate provides the body with energy.
6. Most of our energy should come from complex starchy foods.
7. Vitamins are micronutrients, required in small amounts to do essential jobs in the body.
8. Water soluble vitamins are easily destroyed during preparation and cooking.
9. Water makes up two thirds of the body so it is vital to drink regularly to stay hydrated.
10. Nutritional needs change throughout life, but everyone needs to consider the current healthy eating guidelines when planning meals.
11. Energy balance is the balance of energy consumed through eating and drinking compared to energy burned through physical activity.

Quick Test

1. What are the functions of fat in the diet?
2. Give an example of protein complementation.
3. What does NSP stand for?
4. What are the fat soluble vitamins
5. What is peak bone mass?
6. Why is a good supply of folic acid needed in early pregnancy?
7. What is Osteoporosis?

Food Preparation & Nutrition Knowledge Organiser: Food Preparation Skills

You must be able to understand two different methods of using knives to prepare food safely. Explain the techniques used when preparing different foods that require knife skills. Know how to classify different types of fish. Explain how to choose, handle and prepare different types of fish. Understand the structure of meat and how this affects the cooking methods used. Understand that a recipe consists of specific quantities of ingredients that are prepared, using a variety of skills, to produce the required outcome. Know that making and shaping dough is a precursor to making a variety of flour-based mixtures. Understand the function of ingredients in dough.

Key words

1. Bridge hold
2. Claw grip
3. Jardinière
4. Julienne
5. Macedooine
6. Chiffonade
7. Batonnet
8. Dicing
9. Chopping
10. Paring
11. Flexible
12. Filleting
13. Serrated
14. Cooking

Keywords

1. Salting
2. Connective tissue
3. Coagulate
4. Crustacean
5. Mollusc
6. White fish
7. Flat fish
8. Oil fish
9. Shellfish
10. Classification
11. Omega 3 fatty acid

Keywords

1. Collagen
2. Elastin
3. Myoglobin
4. Muscle Fibre
5. Maillard Reaction
6. Non enzymic browning
7. Gelatine
8. Cross Contamination

Keywords

1. Ingredients
2. Precise
3. Combined
4. Rubbing-in
5. Binding
6. Coating
7. Enriched dough
8. Glazing

Keywords

1. Gliadin
2. Glutenin
3. Gluten
4. Carbon Dioxide
5. Shortcrust
6. Choux

Quick Test

1. Name the two methods of holding food when cutting it.
2. Which type of fish contains the most Omega 3 fatty acids?
3. Describe two quality checks for fresh fish.
4. Tough meat has what length of fibres?
5. Where would you store meat when not preparing it?
6. What glaze would you use on enriched dough?
7. What type of flour is used to make bread dough?
8. What gas does yeast produce?

Key Points

1. Specific types of knives are designed for different cutting and shaping tasks.
2. Knives are dangerous if not handles correctly and care should be taken at all times.
3. A flat and stable cutting surface is essential to avoid injury when cutting food.
4. There are specific terms used for vegetable cuts relating to the size and shape of the outcome.
5. White fish carry oil in the liver; oil fish carry oil throughout the flesh.
6. Its important to wash your hands after handling fish to prevent cross contamination.
7. The length and type of cooking method depends on the type of muscle fibre.
8. Enzymic activity occurs when cut fruit and vegetables react with oxygen to turn them brown.
9. Various foods can be coated with ingredients to create a new layer to protect, add texture and flavour – this is called coating or enrobing.
10. Dough is made by mixing flour with liquid, and sometimes includes leavening (raising) agents as well as other ingredients and flavourings.

Food Preparation & Nutrition Knowledge Organiser: Food Science

You must be able to know and understand the reasons why food is cooked and how heat is transferred to food. Know the reasons for selecting different cooking methods. Understand protein denaturation and coagulation. Know about the properties of protein in gluten formation. Understand enzymic browning and oxidation in fruit and vegetables. Understand the functional and chemical properties of carbohydrates, which are gelatinisation, dextrinization and caramelisation. Understand the processes of raising or aerating using physical and mechanical methods. Know and understand the working properties of chemical and biological raising agents.

Key words

1. Palatability
2. Microwave
3. Radiation
4. Conduction
5. Convection

Keywords

1. Denaturation
2. pH level
3. Marinade
4. Enzymic Browning
5. Oxidation

Keywords

1. Gelatinisation
2. Viscosity
3. Consistency
4. Dextrinisation
5. Caramelisation

Keywords

1. Shortening
2. Plasticity
3. Aeration
4. Creaming
5. Foam
6. Emulsification.

Keywords

1. Physical raising agents
2. Chemical raising agents
3. Yeast
4. Bicarbonate of soda
5. Baking Powder
6. Fermentation
7. Carbon Dioxide

Quick Test

1. Name three types of heat transfer.
2. Why is food cooked?
3. What is the term used to explain the way heat changes the texture of egg proteins?
4. What causes the browning of cut fruit and vegetables?
5. What is the main heat transfer method when boiling food?
6. What sort of heat transfer commonly causes dextrinization?
7. What term describes thickening a sauce using starch?
8. What term describes how fat makes a short texture product?
9. Which basic cake making process traps air into the cake?
10. How does egg white trap air?

Key Points

1. Cooking food makes it safe, allows it to keep for longer and makes it more palatable.
2. Cooking methods can achieve specific characteristics in food.
3. Heat is transferred by conduction, convection and radiation. Cooking commonly uses a combination of heat transfer methods.
4. Proteins are denatured during cooking. Egg proteins coagulate or set when they are heated.
5. Wheat flour contains the protein gluten. Gluten forms the structure of pastries, breads and cakes.
6. Enzymes can cause the browning of fruit and vegetables. Fruit and vegetables need careful handling during preparation to prevent enzymic browning.
7. Gelatinisation is the function of starches as thickening agents.
8. Sauces can be different thicknesses when the proportion of ingredients is altered.
9. Dextrinisation is the term used to describe browning of starch caused by heat.
10. Caramelisation is the browning of sugars caused by heat.
11. Fat makes pastry short and crumbly.
12. Fats give colour and flavour to pastry. The plasticity of fat allows it to be used for rubbing in, spreading and creaming.
13. Fats can help aeration in baking.
14. Emulsions are mixtures of liquids that do not normally mix. E.g oil and water. Egg yolks contain lecithin, a natural emulsifier. Eggs help stabilise mayonnaise.

Food Preparation & Nutrition Knowledge Organiser: Food Safety

You must be able to know the growth conditions for microorganisms and enzymes and the control of food spoilage. Know and understand that bacteria, yeasts and moulds are microorganisms. Explain that enzymes are biological catalysts usually made from proteins. Demonstrate the knowledge and understanding of the use of microorganisms in food production, including moulds in the production of blue cheese, yeast as a raising agent in bread. Know and understand the different sources of bacterial contamination. Know and understand the main types of bacteria that cause food poisoning. Demonstrate knowledge and understanding of the main sources and methods of control of different food poisoning bacteria types. Recognise the symptoms of food poisoning. Know and understand the food safety principles when buying and storing food. Know and understand temperature control and the danger zone temperatures.

Keywords

1. Bacteria
2. Microorganisms
3. Moulds
4. Enzymes
5. Temperature
6. Moisture
7. Time
8. Nutrients
9. pH level
10. Oxidation

Keywords

1. Starter culture
2. Probiotic
3. Pathogens
4. Food Poisoning
5. Contamination
6. Salmonella
7. Staphylococcus Aureus
8. Clostridium Perfingens
9. Clostridium Botulinum
10. Bacillus Cereus
11. Food Borne disease
12. E Coli
13. Listeria
14. Campylobacter
15. Norovirus

Keywords

1. Use by date
2. Best before date
3. Frozen Food
4. Chilled Food
5. High risk foods
6. Low risk foods
7. Danger zone
8. Hygiene

Quick Test

1. What are microorganisms?
2. What is the ideal temperature for bacterial growth?
3. What is the most important bacteria used in food manufacturing?
4. What are the two date marks you need to check when buying food?
5. What is the recommended temperature for chilled food?
6. What is the temperature range of the danger zone?
7. Explain the term cross contamination.
8. List four occasions during food preparation when you must wash your hands.

Key Points

1. Bacteria are found everywhere and need the right temperature, warmth, time, nutrients, pH level and oxygen to grow and multiply.
2. Microorganisms (bacteria) are used to make a wide range of food products.
3. Bacteria are used to make cheese, yogurt and bread.
4. The most important bacteria in food manufacturing are Lactobacillus species.
5. Bacterial contamination is the presence of harmful bacteria in our food, which can lead to food poisoning and illness.
6. As a food handler you must do everything possible to prevent this contamination.
7. What are the main symptoms of food poisoning?
8. Name three bacteria responsible for food poisoning?
9. Which groups of people are more at risk of food poisoning?
10. When handling food at any stage care must be taken to prevent contamination.
11. Everything possible must be done to control the conditions that allow bacteria to multiply causing food poisoning.

Food Preparation & Nutrition Knowledge Organiser: Food Choices

You must be able to understand that religions, customs and beliefs influence food choice. Know about conditions that may be caused by intolerance or allergy to food. Understand the meaning of 'cuisine' in terms of the food related to the traditional eating habits of certain countries. Learn about the cuisine of two other countries as well as British traditional cuisine. Understand how to taste food products using your senses accurately. Know about a range of sensory testing methods. Know which information is legally required for a food label. Explain how this information will help the consumer. Understand the ways in which nutritional labelling can be presented. Provide reasoned suggestions for food choice based on a range of factors.

Key words

1. Kosher
2. Halal
3. Vegetarian
4. Ovo-lacto vegetarian
5. Vegan
6. Lacto vegetarian
7. Ethical
8. Diabetes
9. Coeliac
10. Gluten
11. Protein
12. Malnutrition
13. Lactose intolerance
14. Allergy
15. Anaphylaxis
16. Epi pen

Keywords

1. Senses
2. Taste
3. Aroma
4. Texture
5. Olfactory
6. Sensory analysis
7. Palate
8. Sensory characteristics
9. Rating Tests
10. Ranking tests
11. Star profile
12. Triangle testing
13. Paired preference tests

Keywords

1. Regional
2. Multicultural
3. Cuisine

Keywords

1. Cardiovascular
2. Eatwell Guide
3. Healthy eating
4. Physical Activity Levels (PAL)
5. Availability
6. Seasonality, Lifestyle

Quick Test

1. What religions traditionally do not eat pork?
2. Which foods can people with coeliac disease not include in their diets?
3. Name two traditionally British dishes.
4. Why is it important to use codes when tasting foods?
5. List the stages used to carry out a controlled sensory analysis
6. What is triangular testing?
7. What information must be included on food labels by law?
8. What does PAL mean?
9. Explain the different factors that affect peoples food choice.

Key Points

1. If you can't tolerate certain foods you have to change your diet.
2. Some religions have their own dietary laws and rules.
3. Diabetes is a condition caused because the pancreas doesn't produce any or enough insulin.
4. Coeliac disease is a condition where people have an adverse reaction to gluten.
5. Lactose intolerance is caused when the body is unable to digest lactose (a sugar found in milk and diary products).
6. An allergy to nuts can cause anaphylaxis.
7. The reasons why people become vegetarian include religion, dietary laws, ethical reasons, health or family.
8. Cuisine relates to the established range of dishes and foods of a particular country or religion.
9. Cuisine is also concerned with the use of distinctive ingredients and specific cooking and serving techniques.
10. Accurate sensory testing of foods helps manufacturers and cooks develop food products and improve recipes.
11. The human olfactory system (smell) and taste sensors are important when tasting food.
12. EU= European Union
13. FSA=Food Standards Agency
14. People need to make informed choices about the food they buy based on their income, lifestyle and preferences from the food available to them.
15. Many factors affect the food choices that people make.

Food Preparation & Nutrition Knowledge Organiser: Food Provenance

You must be able to demonstrate knowledge and understanding of the environment issues associated with food and its production. Demonstrate knowledge and understanding of where ingredients are grown, reared and caught. Have a clear understanding of different farming methods and their effect on the environment. Demonstrate knowledge and understanding of the impact that food has on local and global markets. Demonstrate a knowledge of primary and secondary processing. Know and understand how processing affects the sensory and nutritional properties of ingredients.

Key words

1. Transportation
2. Food Miles
3. Food Origin
4. Climate Change
5. Carbon Footprint
6. Recycling
7. Packaging
8. Landfill
9. Food Waste
10. Composting
11. Sustainable food

Keywords

1. Traceability
2. Field to fork
3. Barn reared animals
4. Organic
5. Genetically Modified (GM)
6. Free range
7. Hydroponics
8. Fish Farms
9. Intensive farming

Keywords

1. Green house gases (GHG's)
2. Crop rotation
3. Fairtrade
4. Red Tractor
5. Climate change
6. CFC's
7. Sustainability of food
8. Deforestation

Keywords

1. Homogenised
2. Primary and Secondary processing
3. Pasteurised
4. Skimmed
5. Semi skimmed
6. Ultra heat treated (UHT)
7. Sterilised
8. Evaporated, Condensed

Keywords

1. Preservation
2. Temperature
3. Drying
4. Chemical Preservation
5. Modified Atmospheric Packaging
6. Vacuum packaging, Irradiation

Quick Test

1. Explain what food miles are.
2. Give two ways that fish stocks can be made more sustainable than intensive farming.
3. What are the benefits are free range farming>
4. Why is it important that the origins of food can be traced?
5. What does the flag on the Red Tractor logo mean?
6. How does Fairtrade support farmers in developing countries?
7. Which two gases contribute to global warming?
8. What is the outer skin on the wheat grain called?
9. What is homogenised milk?
10. What type of flour is used to make pasta?
11. Which vitamins may be lost during irradiation?
12. How does vacuum packaging differ to MAP?

Key Points

1. Food and packaging waste contributes to greenhouse gases (GHG's)
2. Seasonal and sustainable foods address many environmental issues.
3. MSC – Marine Stewardship Council = Seafood can be traced back to a certified sustainable fishery.
4. Food miles are the distance food travels from its point of origin to your table. Recycling and producing less waste can help reduce carbon emissions.
5. Nearly a third of all food produced ends up in landfill sites where it gives off methane gas as it decomposes.
6. Cheaper foods are ones that are GM/intensively farmed
7. Best quality protein foods are ones where the welfare of the animals has been considered.
8. Hydroponic farming is the production of food using specially developed nutrient rich liquids rather than soil.
9. Free range farming allows animals to access outdoor areas as part of their life. Increased demand for fish stocks has seen stocks diminishing in the wild due to over fishing.
10. Barn reared animals live in an environment similar to intensive farming
11. Under EU law, all foods need to be traceable from field to fork.
12. Carbon emissions and global climate change affect food and water supplies. Sustainable food production ensures less negative impact on the environment and the farmers.

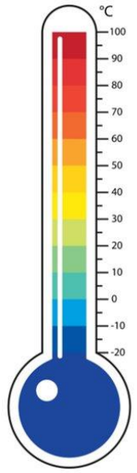
Food Hygiene

Food poisoning
Food poisoning can be caused by:
- bacteria, e.g. through cross-contamination from pests, unclean hands and dirty equipment, or bacteria already present in the food, such as salmonella;
- physical contaminants, e.g. hair, plasters, egg shells, packaging;
- chemicals, e.g. cleaning chemicals.

Bacterial contamination is the most common cause.
Microorganisms occur naturally in the environment, on cereals, vegetables, fruit, animals, people, water, soil and in the air. Most bacteria are harmless but a small number can cause illness.
Harmful bacteria are called pathogenic bacteria.
The process of food becoming unfit to eat through oxidation, contamination or growth of micro-organisms is known as food spoilage.

Bacterial growth and multiplication
All bacteria, including those that are harmful, have four requirements to survive and grow:
- food;
- moisture;
- warmth;
- time.

Temperatures to remember
To reduce the risk of food poisoning, good temperature control is vital:
- 5-63°C – the danger zone where bacteria grow most readily.
- 37°C – body temperature, optimum temperature for bacterial growth.
- 8°C – maximum legal temperature for cold food, i.e. your fridge.
- 5°C (or below) – the ideal temperature your fridge should be.
- 75°C – if cooking food, the core temperature, middle or thickest part should reach at least this temperature.
- 75°C – if reheating food, it should reach at least this temperature. In Scotland food should reach at least 82°C.



Allergen and food intolerance awareness
There are 14 ingredients (allergens) that are the main reason for adverse reactions to food. Cross-contamination of food containing these allergens must be prevented to reduce the risk of harm. They must also be labelled on pre-packaged food and menus so that consumers can make safe choices. The 14 allergens are:

Celery (and celeriac)
Cereals containing gluten
Crustaceans
Eggs
Fish
Lupin
Milk
Molluscs
Mustard
Nuts
Peanuts
Sesame
Soybeans
Sulphur dioxide

Key terms
Allergens: Substances that can cause an adverse reaction to food. Cross-contamination must be prevented to reduce the risk of harm.
Bacteria: Small living organisms that can reproduce to form colonies. Some bacteria can be harmful (pathogenic) and others are necessary for food production, e.g. to make cheese and yogurt.
Cross-contamination: The transfer of bacteria from one source to another. Usually raw food to ready-to-eat food but can also be the transfer of bacteria from unclean hands, equipment, cloths or pests. Can also relate to allergens.
Food poisoning: Illness resulting from eating food which contains food poisoning micro-organisms or toxins produced by micro-organisms.
High risk ingredients: Food which is ready to eat, e.g. cooked meat and fish, cooked eggs, dairy products, sandwiches and ready meals.

Where should food be stored in the fridge?

Cheese, dairy and egg-based products
The temperature is usually coolest and most constant at the top of the fridge, allowing these foods to keep best here.

Cooked meats
Cooked meats should always be stored above raw meats to prevent contamination from raw meat.

Raw meats and fish
Raw meats and fish should be below cooked meats and sealed in containers to prevent contamination of salad and vegetables.

Salad and vegetables
These should be stored in the drawer(s) at the bottom of the fridge. The lidded drawers hold more moisture, preventing the leaves from drying out.

High risk food
Bacteria easily multiply on foods known as 'high-risk food'. These are often high in protein or fat, such as cooked meat and fish, dairy foods and eggs. Cooked pasta and rice are also regarded as high risk foods if they are not cooled quickly after cooking and stored below 5°C.

Moisture
Bacteria need moisture to survive. Dried foods, such as powdered milk, cereals or dried egg do not support bacterial growth, if properly stored. However, if moisture is added, any bacteria still alive can quickly begin to multiply.

Time
When bacteria spend enough time on the right types of food, at warm temperatures, they can multiply to levels that cause illness.

Reheat food only once and eat leftovers within 48 hours.

Getting ready to cook
- Remove blazers/jumpers and roll up long sleeves.
- Tie up long hair and tuck in ties or head coverings.
- Thoroughly wash and dry hands.
- Put on a clean apron.

Symptoms of food poisoning
The symptoms of food poisoning include:
- nausea;
- vomiting;
- stomach pains;
- diarrhoea.

People at risk
Elderly people, babies and anyone who is ill or pregnant needs to be extra careful about the food they eat.

Why clean?
To remove grease, dirt and grime, and prevent food poisoning and pests.

Use-by-date
You've got until the end of this date to use or freeze the food before it becomes too risky to eat.

USE BY:

25/08/20

KEEP REFRIGERATED

Best-before-date
You can eat food past this date but it might not be at its best quality.

BEST BEFORE:

25/08/21

STORE IN A COOL DRY PLACE

Task
Create a poster highlighting the top tips for ensuring food is safe to eat. Include personal hygiene, safe storage, preparation, and cooking of food.

Macronutrients

Macronutrients provide energy.

The macronutrients are:

- carbohydrate;
- protein;
- fat.

Macronutrients are measured in grams (g).

Protein complementation

Different food contains different amounts and combinations of amino acids.

Vegans and vegetarians can get all the amino acids they need by combining different protein types at the same meal. This is known as protein complementation.

Examples are:
rice and peas;
beans on toast;
hummus and pitta bread;
bean chilli served with rice.

Protein

Made up of building blocks called amino acids.

There are 20 amino acids found in protein.

Eight amino acids have to be provided by the diet (called essential amino acids).

The essential amino acids are isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine.

In young children, additional amino acids, e.g. histidine and tyrosine, are sometimes considered to be essential (or 'conditionally essential') because they may be unable to make enough to meet their needs.

Recommendations

0.75g/kg bodyweight/day in adults.

Sources:

Animal sources: meat; poultry; fish; eggs; milk; dairy food.

Plant sources: soya; nuts; seeds; pulses, e.g. beans, lentils; mycoprotein.

In young children, additional amino acids, e.g. histidine and tyrosine, are sometimes considered to be essential (or 'conditionally essential') because they may be unable to make enough to meet their needs.

Fat

Sources of fat include:
saturated fat;
monounsaturated fat;
polyunsaturated fat.

Fats can be saturated, when they have no double bonds, monounsaturated, when they have one double bond, or polyunsaturated, when they have more than one double bond.

Recommendations

<35% energy, Saturated fat <11% energy.

A high saturated fat intake is linked with high blood cholesterol levels.

Sources:

Saturated fat: fatty cuts of meat; skin of poultry; butter; hard cheese; biscuits, cakes and pastries; chocolate.

Monounsaturated fat: edible oils especially olive oil; avocados; nuts.

Polyunsaturated fatty acids: edible oils especially sunflower oil; seeds;
margarine; spreadable fats made from vegetable oils and oily fish.

Dietary reference values (DRVs) are a series of estimates of the energy and nutritional requirements of different groups of healthy people in the UK population. They are not recommendations or goals for individuals. **Reference Intakes** are guidelines for the maximum amount of energy (calories), fat, saturated fat, sugars and salt consumed in a day (based on a healthy adult female).

Carbohydrate

All types of carbohydrate are compounds of carbon, hydrogen and oxygen. They can be divided into three main groups according to the size of the molecule.

These three types are:
monosaccharides (e.g. glucose);
disaccharides (e.g. lactose);
polysaccharide (e.g. sucrose).

The two types main of carbohydrate that provide dietary energy are starch and sugars. Dietary fibre is also a type of carbohydrate.

Starchy carbohydrate is an important source of energy.

Starchy foods - we should be choosing wholegrain versions of starchy foods where possible.

Recommendations

- Total carbohydrate - around 50% of daily food energy.
- Free sugars include all sugars added to foods plus sugars naturally present in honey, syrups and unsweetened fruit juice (<5% daily food energy).
- Fibre is a term used for plant-based carbohydrates that are not digested in the small intestine (30g/day for adults).

Fibre

- Dietary fibre is a type of carbohydrate found in plant foods.
- Food examples include wholegrain cereals and cereal products; oats; beans; lentils; fruit; vegetables; nuts; and, seeds.

Dietary fibre helps to:

- reduce the risk of heart disease, diabetes and some cancers;
- help weight control;
- bulk up stools;
- prevent constipation;
- improve gut health.

Hydration

Aim to drink 6-8 glasses of fluid every day.
Water, lower fat milk and sugar-free drinks including tea and coffee all count.
Fruit juice and smoothies also count but should be limited to no more than a combined total of 150ml per day.

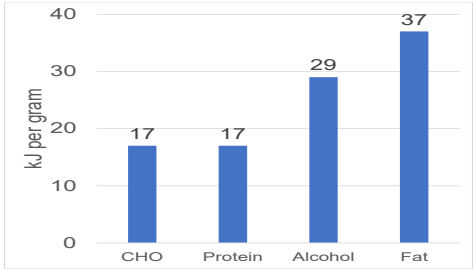
20% of water is provided by food such as soups, yogurts, fruit and vegetables.
The other 80% is provided by drinks such as water, milk and juice.

Drinking too much water can lead to 'water intoxication' with potentially life threatening hyponatraemia.
This is caused when the concentration of sodium in the blood gets too low.

Energy from food

- Energy intake is measured in joules (J) or kilojoules (kJ), but many people are more familiar with Calories (kcal).
- Different macronutrients, and alcohol, provide different amounts of energy.

	Energy per gram
Carbohydrate	16kJ (3.75 kcals)
Protein	17kJ (4 kcals)
Alcohol	29kJ (7kcals)
Fat	37kJ (9 kcals)



Key terms

Dietary reference values: Estimated dietary requirements for particular groups of the population.
Essential amino acids: 8 of the different amino acids found in proteins from plants and animals that have to be provided by the diet.
Macronutrients: Nutrients needed to provide energy and as the building blocks for growth and maintenance of the body.
Protein complementation: combining different protein types at the same meal to ensure all EAAs are ingested.
Reference Intakes: Guidelines for the maximum amount of nutrients consumed.

Micronutrients are needed in the body in tiny amounts. They do not provide energy, but are required for a number of important processes in the body.

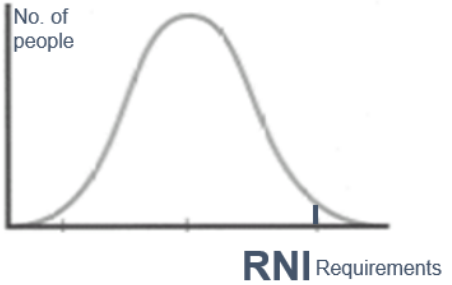
There are two main groups of micronutrients:
vitamins;
minerals and trace elements.

Micronutrients are measured in milligrams (mg) and micrograms (µg) with 1mg = 0.001g and 1µg = 0.001mg.

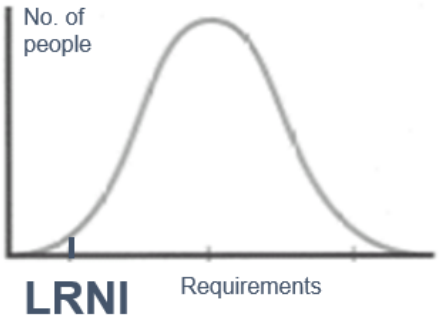
Micronutrient recommendations
People have different requirements for each micronutrient, according to their:
age;
gender;
physiological state (e.g. pregnancy).

Micronutrient recommendations

The recommendations for vitamins and minerals are based on the **Reference Nutrient Intake (RNI).**



When looking at low intakes of micronutrients, the Lower Reference Nutrient Intake (LRNI) is used.



Vitamins
Vitamins are nutrients required by the body in small amounts, for a variety of essential processes.

Most vitamins cannot be made by the body, so need to be provided in the diet.

Vitamins are grouped into:
- fat-soluble vitamins (vitamins A, D, E and K);
- water-soluble vitamins (B vitamins and vitamin C).

Minerals
Minerals are inorganic substances required by the body in small amounts for a variety of different functions.

The body requires different amounts for each mineral.

Some minerals are required in larger amounts, while others are needed in very small amounts and are called ‘trace elements’.

Vitamins

Nutrient	Function	Sources
Vitamin A	Helps the immune system to work as it should and with vision.	Liver, cheese, eggs, dark green leafy vegetables and orange-coloured fruits and vegetables.
B vitamins	Thiamine, riboflavin, niacin, folate, and vitamin B12 have a range of functions within the body.	Different for each B Vitamin.
Vitamin C	Helps to protect cells from damage and with the formation of collagen.	Fruit (especially citrus fruits), green vegetables, peppers and tomatoes.
Vitamin D	Helps the body to absorb calcium & helps to keep bones strong.	Oily fish, eggs, fortified breakfast cereals and fat spreads.
Vitamin E	Helps to protect the cells in our bodies against damage.	Vegetable and seed oils, nuts and seeds, avocados and olives.
Vitamin K	Needed for the normal clotting of blood and is required for normal bone structure.	Green vegetables and some oils (rapeseed, olive and soya oil).

Key terms

Micronutrients: Nutrients needed in the diet in very small amounts.

Lower Reference Nutrient Intake (LRNI): is the amount of a nutrient that is enough for only the small number of people who have low requirements (2.5%). The majority of people need more.

Reference Nutrient Intake (RNI): the amount of a nutrient that is enough to ensure that the needs of nearly all the group (97.5%) are being met. The RNI is used for recommendations on protein, vitamins and minerals.

Vitamin D

Vitamin D is a pro-hormone in the body. It can be obtained in two forms:
ergocalciferol (vitamin D_2);
cholecalciferol (vitamin D_3).

Vitamin D_3 is also formed by the action of sunlight. Different to most vitamins, the main source of vitamin D is synthesis in the skin following exposure to sunlight. The wavelength of UVB during the winter months in the UK does not support vitamin D synthesis.

Minerals

Nutrient	Function	Sources
Calcium	Helps to build and maintain strong bones and teeth.	Dairy, calcium-fortified dairy-alternatives, canned fish (where soft bones are eaten) and bread.
Iron	Helps to make red blood cells, which carry oxygen around the body.	Offal, red meat, beans, pulses, nuts and seeds, fish, quinoa, wholemeal bread and dried fruit.
Phosphorus	Helps to build strong bones and teeth and helps to release energy from food.	Red meat, poultry, fish, milk, cheese, yogurt, eggs, bread and wholegrains.
Sodium	Helps regulate the water content in the body.	Very small amounts found in foods. Often added as salt.
Fluoride	Helps with the formation of strong teeth and reduce the risk of tooth decay.	Tap water, tea (and toothpaste).
Potassium	Helps regulate the water content in the body and maintain a normal blood pressure.	Some fruit and vegetables, dried fruit, poultry, red meat, fish, milk and wholegrain breakfast cereals.
Iodine	Helps to make thyroid hormones. It also helps the brain to function normally.	Milk, yogurt, cheese, fish, shellfish and eggs.