Principles of Nutrition

Macronutrients

Protein	Carbohydrates	Fats
Functions		
• growth • repair • cell maintenance.	• energy	• warmth • hormone production • energy • fat soluble vitamins.
Food Sources		
HBV: • meat • fish • cheese • milk • eggs • soya. **LBV:** • cereals • pulses • nuts • seeds.	**Starch:** • cereals • bread • pasta • rice • potatoes. **Sugar:** • cake • biscuit • sweets • fizzy drinks • processed foods	**Saturated:** • meat • cheese • lard • butter. **Monounsaturated:** • olive oil • almonds • avocado. **Polyunsaturated:** • sunflower oil • oily fish • seeds.

Micronutrients

Vitamins		Minerals
Functions		
convert food to energy • repair cell damage • support immune system • help absorb minerals		• bones/teeth formation • cell formation • repair cell damage • control cell fluid.
Food Sources		
Water Soluble Vitamin B: • milk • eggs • wholegrains. **Vitamin C:** • citrus fruits • sprouts • red peppers • potatoes • liver • kiwi fruit.	**Fat Soluble Vitamin A:** • leafy veg • oily fish • cheese • eggs • orange/yellow fruits. **Vitamin D:** • oily fish • eggs • fortified margarine. **Vitamin E:** • wheatgerm • seeds.	**Calcium:** • meat • dairy foods • green leafy veg • soya **Iron:** • red meat • dark green leafy veg • beans • nuts **Sodium:** • salt • processed foods • cured meats.

Understanding the importance of nutrition

Macronutrients

Carbohydrates - Carbohydrates are mainly used in the body for energy. There are two types of carbohydrates which are:

- **Starch** - Examples include bread, pasta, rice, potatoes and cereals.
- **Sugar** - Examples include sweets, cakes, biscuits & fizzy drinks.

Fat - This is needed to insulate the body, for energy, to protect bones and arteries from physical damage and provides fat soluble vitamins. There are two main types of fat which are:

- **Saturated fat** - Examples include butter, lard, meat and cheese.
- **Unsaturated fat** - Examples include avocados, plant oils such as sunflower oil, seeds and oily fish.

Protein - Protein is mainly used for growth and repair in the body and cell maintenance. There are two types of protein which are:

- **High biological value (HBV) protein** - Includes meat, fish, poultry, eggs, milk, cheese, yogurt, soya and quinoa.
- **Low biological value (LBV) protein** - Includes cereals, nuts, seeds and pulses.

Micronutrients

Vitamins

- **Fat soluble vitamin A** - Main functions include keeping the skin healthy, helps vision in weak light and helps children grow.
- **Fat soluble vitamin D** - The main function of this micro-nutrient is to help the body absorb calcium during digestion.
- **Water soluble vitamin B group** - Helps absorbs minerals in the body, release energy from nutrients and helps to create red blood cells.
- **Water soluble vitamin C** - Helps absorb iron in the body during digestion, supports the immune system and helps support connective tissue in the body which bind cells in the body together.

Minerals

- **Calcium** - Needed for strengthening teeth and bones.
- **Iron** - To make haemoglobin in red blood cells to carry oxygen around the body.
- **Sodium** - Controls how much water is in the body and helps with the function of nerves and muscles.
- **Potassium** - Helps the heart muscle to work correctly and regulates the balance of fluid in the body.
- **Magnesium** - Helps convert food into energy.
- **Dietary fibre (NSP)** - Helps digestion and prevents constipation.
- **Water** - Helps control temperature of the body, helps get rid of waste products from the body and prevents dehydration.

The Eatwell Guide

The Eatwell Guide shows how much of what we eat overall should come from each food group to achieve a healthy, balanced diet.

Fruit & vegetables
- 5 portions a day.
- 1 portion is a handful or 80g.
- Eat a balance of fruit and veg
- Fruit and vegetables should make up at least 1/3 of each meal.
- It doesn't matter how you eat them: fresh, frozen, tinned, dried or in a juice format.

Starchy foods
- Choose wholegrain or high fibre versions.
- Each meal should be based on at least 1/3of starchy carbohydrates.
- Starchy carbohydrates include: pasta, rice, potatoes, bread, breakfast cereals.

Sugar
Eat sugary / sweet foods in small quantities and less often.

Water
Don't forget to drink water to prevent dehydration.

Protein-rich, non-dairy foods / Dairy and alternatives
1/3 of your meals should be made up from any combination of the following:
- dairy foods
- animal protein foods
- peas and beans
- dairy and meat alternatives.

Oils and spreads
Although important we should eat these sparingly and use low fat options.

Nutrition at different life stages

Adults	Children
Early • Growth in regard to height of the body continues to develop until 21 years of age. • Therefore, all micro-nutrients and macro-nutrients especially carbohydrates, protein, fats, vitamins, calcium and iron are needed for strength, to avoid diseases and to maintain being healthy.	**Babies** • All nutrients are essential and important in babies, especially protein as growth and development of the body is very quick at this stage. • Vitamins and minerals are also important. You should try to limit the amount of salt and free sugars in the diet.
Middle • The metabolic rate starts to slow down at this stage, and it is very easy to gain weight if the energy intake is unbalanced and there isn't enough physical activity.	**Toddlers** • All nutrients remain very important in the diet at this stage as growth remains. • A variety of foods are needed for toddlers to have all the micro-nutrients and macro-nutrients the body needs to develop.
Elderly • The body's systems start to slow down with age and a risk of blood pressure can increase as well as decrease in appetite, vision and long-term memory. • Because of this, it is essential to keep the body strong and free from disease by continuing to eat a healthy, balanced diet.	**Teenagers** • The body grows at a fast pace at different times at this stage as the body develops from a child to an adult, therefore all nutrients are essential within proportions. • Girls start their menstruation which can sometimes lead to anaemia due to not having enough iron in the body.

Special dietary needs

Different energy requirements based on:	Dietary requirements:	Medical conditions:
• Lifestyles • Occupation • Age • Activity level. • The amount of energy the body needs is determined with each of the above factors e.g. active lifestyle or physical activity level would need more energy compared to a person being sedentary.	• **Religious beliefs** – Different religions have different dietary requirements. • **Vegetarian** – Avoids eating meats and fish but does eat dairy products and protein alternatives such as quorn and tofu. • **Vegan** – Avoids all animal foods and products but can eat all plant-based foods and protein alternatives such as tofu and tempeh. • **Pescatarian** – Follows a vegetarian diet but does eat fish products and seafood.	• **Allergens** – Examples of food allergies include milk, eggs, nuts and seafood. • **Lactose intolerance** – Unable to digest lactose which is mainly found in milk and dairy products. • **Gluten intolerance** – Follows a gluten free diet and eats alternatives to food containing wheat, barley and rye. • **Diabetes (Type 2)** – High level of glucose in the blood, therefore changes include reducing the amount of fat, salt and sugar in the diet. • **Cardiovascular disorder** – Needing a balanced, healthy diet with low levels of salt, sugar and fat. • **Iron deficiency** – Needing to eat more dark green leafy vegetables, fortified cereals and dried fruit.

How cooking methods can impact on nutritional value

Cooking Method	Impact on nutritional value in food
Boiling	• Up to 50% of vitamin C is lost when boiling green vegetables in water. • The vitamin B group is damaged and lost in heat.
Poaching	• The vitamin B group are damaged in heat and dissolve in water.
Roasting	• Roasting is a method of cooking in high temperatures and so this will destroy most of the group C vitamins and some of the group B vitamins
Frying	• Using fat whilst frying increases the amount of vitamin A the body can absorb from some vegetables • Cooking in fat will increase the calorie count of food e.g deep fat frying foods.
Stir-frying	• The small amount of fat used whilst stir-frying increases the amount of vitamin A the body can absorb from some vegetables. • Some vitamin C and B are lost due to cooking in heat for a short amount of time.
Steaming	• Steaming is the best cooking method for keeping vitamin C in foods. • Only up to 15% of vitamin C is lost as the foods do not come into contact with water.
Grilling	• Using this cooking method can result in losing up to 40% of group B vitamins. • It is easy to overcook protein due to the high temperature used in grilling foods.
Baking	• Due to high temperatures in the oven, it is easy to overcook protein and damage the vitamin C and B group vitamins.