

Keywords and definitions:

Antioxidant: these help protect cell membrane and to maintain healthy skin and eyes.

Deficiency: Having too little of something, that may cause a health problem

Excess Having too much of something, that may cause a health problem

Fortified: strengthening the nutritional content of a food by adding vitamins and minerals during production.

Haemoglobin: a red protein that gives blood its colour. It transports oxygen around the body using the red blood cells.

Mineral: an inorganic substance needed by the human body for good health

Night Blindness: a condition where you are unable to see in dim light or at night, typically caused by vitamin A deficiency

Osteomalacia: a medical condition where the bones become soft and weak due to the lack of Vitamin D and Calcium.

Osteoporosis: a medical condition where bones become weak, brittle and break easily.

Peak Bone Mass: When bones reach their maximum strength

Rickets: a childhood disease caused by lack of vitamin D; it causes the bones to soften, resulting in bow legs

Spina bifida: a defect of the lower spine that can result in paralysis in the legs and feet and is sometimes accompanied by learning difficulties

Thyroid: a gland at the front of your neck. It produces hormones that control the bodies metabolism

Vitamin: A group of organic compounds which are essential for normal growth and nutrition. They are required in small quantities in the diet because they cannot be synthesized by the body. If you are deficient in vitamins, you may need to take a vitamin supplement in the form of powder or tablet.

Micro-Nutrients

Vitamins:

- Vitamin A, C and E contain antioxidants that work together to protect cells.
- Vitamins B and C are water-soluble so will dissolve into water during cooking.
- Vitamins B1 and C are destroyed by heat and Vitamin C is destroyed by exposure to oxygen.
- To maximise vitamin retention:
 - prepare foods quickly just before serving
 - use small amounts of boiling water to cook
 - use excess boiled water to make sauces as the vitamins will be in the water
 - Avoid cutting lots of nutrients
 - Cook foods with water soluble vitamins by steaming, grilling or roasting instead of boiling
 - Cook foods with fat soluble vitamins by boiling, steaming or grilling instead of roasting

Mineral	Function	Source	Deficiency / Excess
Calcium	Strong bones and teeth – growth of children – blood clots – nerves and muscles	Milk – dairy – green leafy veg – fortified white bread – soya – fish eaten with bones (sardines)	Deficiency: bones don't reach peak bone mass – osteoporosis – poor clotting
Iron	Production of haemoglobin to transport oxygen	Red meat – liver – lentils spices – chocolate – green leafy veg – fortified cereals	Deficiency: anaemia
Fluoride	Strengthen enamel on teeth	Saltwater fish – tea – fortified water	Deficiency: Dental cavities
Magnesium	Healthy immune system – bone and teeth growth	Spinach – brown rice – pumpkin seeds – mackerel	Deficiency: cramps and muscle spasms and weakness-migraines
Sodium	Regulate water in body – use of energy – control muscles and nerves	Processed foods – salt	Deficiency: Rare – cramps after exercise Excess: high blood pressure – heart disease - stroke
Iodine	Regulates hormones in the thyroid	Seafood – foods grown in iodine rich soil	Deficiency: tired – lethargic – swollen thyroid

Vitamin	Function	Source	Deficiency / Excess
A Retinol Fat-Soluble	Iron metabolism Vision – skin-mucus immune system	Liver – whole milk - green leafy veg - carrots – fortified marg	Excess – liver & bone damage / birth defects Deficiency – Night blindness
D Cholecalciferol Fat-Soluble	Absorption and use of calcium Bone and teeth strength	Oily fish – meat – eggs – fortified cereals - sunlight	Deficiencies – weak bones & teeth – Rickets in Children – Osteomalacia in adults
E Tocopherol Fat-Soluble	Skin eyes - Antioxidant protects cell membrane	Polyunsaturated fats e.g. sunflower oil – nuts - seeds	Very rare
K Phytomenadione Fat-Soluble	Normal clotting of blood	Green leafy veg – cheese – bacon - liver	Rare Newborn babies given a dose of Vitamin K
B1 Thiamin Water-Soluble	Release energy – nervous system – growth of children	Wholegrains – meat – dairy – nuts – fortified flour and cereals	Deficiency – Beriberi, a disease that affects the nervous system
B2 Ribflavin Water-Soluble	Release energy – nervous system	Same as Vitamin B1	Deficiency – cracking skin around mouth – swollen tongue – growth issues
B3 Niacin Water-Soluble	Release energy from carbohydrates foods – nervous system	Dairy – meat – poultry – cereals – wholegrains	Deficiency – Rare but Pellagra could develop (diarrhoea, dermatitis, dementia)
B9 Folate / Folic Acid Water-Soluble	Neural tube development in unborn babies	Green leafy veg – potatoes-beans, nuts, seeds, - cereal - wholegrains	Deficiency – Spina bifida in unborn babies. Pre conception and pregnant women need a good supply
B12 Cobalamin Water-Soluble	Energy production – protective coating around nerve cells	Meat – fish – cheese – eggs – milk – marmite – fortified cereals	Deficiency – Pernicious anaemia
C Ascorbic acid Water-Soluble	Iron absorption – collagen production - antioxidant	Citrus fruits – blackcurrant – potato – green veg	Deficiency – weak connective tissue and blood vessels – bleeding gums - anaemia