



Keywords

Word	Definition
Macronutrients	The nutrients our bodies need in large amounts to provide us with sufficient energy
Micronutrients	The nutrients our bodies need in small amounts, their use is critical to bodily functioning and deficiency causes severe and sometimes life-threatening conditions.
Vitamin B Complex	A group of 8 water-soluble vitamins, with essential and closely related roles to the body's cellular function.
Low Density Lipoprotein (LDL)	Known as 'bad cholesterol', causes plaque to build in the arteries leading to atherosclerosis and heart disease.
High Density Lipoprotein (HDL)	Known as 'good cholesterol', absorbs bad cholesterol and transports it back to the liver to be removed from the body.
Glycogen	The stored form of glucose in the body. Glycogen is stored in the liver and muscles.
Supercompensation	Maximising glycogen stores above previous levels in preparation for endurance events.

Key skills

- Diet analysis to meet the demands of different athlete's needs.
- Evaluation of nutritional strategies to maximise performance

The Exercise Related Function of Food Classes

Macronutrients

Carbohydrates (bread/rice/pasta/fruits/veg)	Principle source of energy, converted to glucose to be used in the aerobic and anaerobic energy systems. Stored as glycogen in the liver and muscle cells.
Fats (nuts/ oils/ avocado)	Unsaturated fats provide a major source of energy for aerobic respiration. HDL removes LDL maintaining healthy cholesterol levels.
Protein (meat/ beans/ pulses)	Growth and repair of muscle tissue to increase adaptations from training. Also used to make enzymes, haemoglobin and hormones.
Fibre (cereals/ fruit/ veg)	Slows down energy release in the body. Maintains healthy digestion.

Micronutrients

Vitamin C	Protects cells/ maintains connective tissues
Vitamin D	Assists with the absorption of calcium
Vitamin B Complex	Release of energy from food/ healthy nervous system/ production of RBC
Calcium	Strong bones / efficient nerve and muscle function
Iron	Formation of haemoglobin
Sodium	Regulates fluid levels in the body.



Dietary Supplementations

CREATINE MONOHYDRATE

- + Increases the amount of **phosphocreatine** stored in the muscles.
- + Increasing **PC** stores will extend the amount of time the ATP-PC system can be used to maximise maximal intensity, maximal force efforts. Most suitable for explosive events, 100m/shotput/w.lifting
- + Increases muscle mass and muscular strength.
- Side effects: bloating/cramps/diarrhoea/sickness/water retention
- Mixed evidence on it's benefits as a supplement.

SODIUM BICARBONATE

- + An antacid that increases the buffering capacity of the blood, lowering blood acidity.
- + Neutralises the negative effects of hydrogen ions and lactate on the body, thus delaying the onset of fatigue.
- Side effects: sickness/ pain/ cramping/ diarrhoea/ bloating.

CAFFEINE

- + Naturally occurring stimulant which increases mental alertness and reduces fatigue.
- + Improves the mobilisation of fatty acids, increasing the use of fats as an aerobic energy source for endurance athletes and produces a **glycogen sparring effect** which delays the onset of fatigue in the latter stages of races.
- side effects: water-loss causing dehydration/ loss of fine motor control/ digestive issues/ insomnia

Dietary Manipulation Method – GLYCOGEN LOADING

- Various techniques to reduce or deplete glycogen stores in the body, which opens a carbo-window which replenishes glycogen stores by up to twice their original amount (supercompensation), thus improving endurance capacity in the lead up to events.
- Causes bloating/water retention/heavy legs/reduction in power output/ decrease in confidence leading up to the event/ irritability.

Hydration and Electrolyte Balance

- + Blood plasma is 90% water, it transports nutrients, hormones and waste products around the body.
- + Water regulates body temperature and is lost through sweat during the cooling-process.
- If water content isn't replaced, dehydration occurs which decreases performance due to the following:
 - decreased plasma volume
 - increased blood viscosity
 - reduced oxygen delivery to the muscles
 - increase in body temperature
 - increase in heart rate
 - increased cardiovascular drift

Rehydration should include **electrolytes** such as sodium to improve the efficiency of muscle contraction, nerve impulses and cellular function.

Box 6: Pathway

Previous knowledge: Cardiovascular system, venous return, energy systems.

Future links: Recovery from exercise, Training Preparation.

Careers: Sports nutritionist, Dietician, exercise physiologist.

Box 7: Cross curricular links