

Food classes and the marathon

PE REVIEW explains how to apply your knowledge of food classes to meet the assessment objectives when answering exam questions on maximising performance in the marathon

AO1: knowledge of food classes

Carbohydrates are a primary source of energy, especially in higher-intensity activities. They can be found in foods such as pasta, rice, potatoes and fruit.

Proteins provide amino acids for muscle growth and repair. Meat, fish, eggs and dairy products are good sources of protein.

Fats are a major source of energy for low-intensity aerobic work and are a carrier for the fat-soluble vitamins A, D, E and K. Nuts, seeds and fish are good sources of unsaturated fats.

Vitamins are essential for maintaining healthy body functions. The four fat-soluble vitamins – A, D, E and K – are found in dairy products, vegetable oils and eggs. Water-soluble vitamins – the B vitamins and vitamin C – are found in fruit, vegetables and dairy products.

Minerals assist in bodily functions. Calcium is needed for strong bones and teeth and efficient nerve and muscle function. Sodium helps regulate fluid levels and iron helps form haemoglobin in red blood cells. Good sources of minerals are meat, fish, eggs, dairy products, cereals, fruit, vegetables and nuts.

Fibre is important during exercise as it can slow down the time it takes the body to break down food, which results in a slower, more sustained release of energy. It also causes bulk in the small intestine, helping to prevent constipation and aiding digestion. Good sources of fibre are wholemeal bread and pasta, potatoes, nuts, seeds, fruit, vegetables and pulses.

Water transports nutrients, hormones and waste products around the body. It is the main component of many cells and plays an important part in regulating body temperature.

AO2: application of food classes to the marathon

Carbohydrates provide energy throughout the marathon. As the only food that provides energy for high-intensity work, carbs are vital for sprint finishes and hill climbs.

Proteins help repair any muscle damage caused by long-duration training sessions.

Fats provide energy during long-duration, lower-intensity events such as the marathon.

Vitamins play an essential role in energy production during the marathon. They also facilitate muscle growth and repair from training sessions so fitness gains can be made.

Minerals such as calcium are important for bone health and nerve transmission throughout training and the race itself. As sodium helps regulate fluid levels and iron helps form haemoglobin in red blood cells, they are both crucial for aerobic work and helping to transport the necessary oxygen to the working muscles over a long period of activity.

Fibre helps marathon runners maintain a healthy digestive system and aids in weight management.

Water is required to replace that which has been lost through sweating during training and the race itself.

AO3: analysis/evaluation of how food classes maximise performance in a marathon

Carbohydrates are the main energy provider and enable fitness gains to be made during training sessions. In the race itself, carbohydrates provide the energy needed to be successful.

Proteins enable muscle damage/micro tears to be repaired more quickly and effectively following training so that muscles become stronger and more injury resistant.

Fats used during the race/training allow for the conservation of glycogen (carbohydrate) stores for any higher-intensity work. This helps to prevent the marathon runner from 'hitting the wall'. Fats are also a carrier for essential fat-soluble vitamins, helping to maintain the body's functions during long training sessions and the race itself.

Vitamins are integral to success in the marathon. Vitamin D helps absorb calcium, which is crucial for a marathon runner's muscle function during the race. The B vitamins help convert food into the required energy for the marathon.

Minerals facilitate the transmission of nerve impulses, so enabling effective muscle contraction and preventing muscle cramps and fatigue. They also help maintain fluid balance in the body. The formation of haemoglobin allows for the efficient transportation of oxygen, which is essential for sustained energy production during the marathon.

Fibre helps the marathon runner achieve an optimum 'race weight'.

Water is required to maintain hydration throughout training and the race in order to prevent the negative effects of dehydration (decreased plasma volume, stroke volume and increased temperature and heart rate).

