

Nutrition for Sports Performance

Energy from Food and Energy for Work

The energy contained in food that we eat is used by the body to do work or is stored as an energy store in the body. Work may be the internal work involved in keeping the body healthy or it may be external work involved in walking, lifting or any of the many other activities that make up our daily lives. We will look more closely later at the body's energy stores, but the main stores are in the form of carbohydrate, which is a very small store, and fat. Our fat stores can increase to very high levels, and if the diet supplies more energy than we need, most of the excess will end up in the form of fat.

The body uses its stored energy to do work and the muscles and all other tissues need a constant energy supply. If energy is not available at exactly the rate required by each cell, the cell faces an energy crisis. To maximise the potential of each cell, a number of different energy sources are available. Anaerobic sources can supply energy at high rates, but have a limited capacity, so fatigue sets in rapidly if these are called upon. Aerobic metabolism allows the cells to produce large amounts of energy, but only at a much slower rate than is possible with anaerobic metabolism. This has the advantage of allowing endurance activities, but is obviously not effective when high intensity effort is needed as in sprinting.

Energy Sources During Exercise

Anaerobic metabolism:

- Allows very high power outputs, as in sprinting

- Limited capacity, so fatigues rapidly

Aerobic metabolism:

- Cannot produce energy at very high rates

- Large capacity, so allows prolonged exercise

Energy for Working Muscles:

Muscles need energy to do work. The harder we work, the faster the rate at which energy must be supplied to the muscles.

Energy expenditure is a function of speed and body weight.

The sprinter needs high rates of energy supply: the distance runner requires a sustained lower power output. This makes use of the different energy sources available to the muscles.