

Improve your Sports performance through proper nutrition

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Learning objectives:

- To understand the energy and nutrient needs of athletes.
- To know the forms of stored energy in the body.
- To recognise the need for carbohydrate loading for endurance athletes.
- To recognise the importance of fluid intake.
- To recall the two nutrients, iron and calcium, which are important for female athletes.

Nutritional needs of athletes:

- Most athletes obtain all the energy and nutrients they require from a varied and balanced diet.
- By changing their diet slightly they may be able to improve sporting performance.
- Many athletes require a diet high in energy because of their high energy expenditure during training and competition.

Maintaining a healthy body weight:

- Maintaining a healthy body weight is important.
- Reduced athletic performance can be caused by too much body fat or too little muscle.
- Symptoms of this are being overweight or underweight.



Stored energy:

- Energy from the diet is stored as body fat or glycogen (carbohydrate in muscles and liver) and can be broken down to provide energy.
- Glycogen is the main source of energy during short bursts of activity and at the start of exercise.
- There is only a small store of glycogen in the body, and as exercise continues the store becomes depleted and the body starts to use some fat to provide energy.
- Most people have quite a large store of body fat.
- People who are fitter use up their store of glycogen more slowly, and tend to use their stores of body fat for fuel more readily.

The importance of carbohydrate:

- Eating a diet high in carbohydrate ensures that muscle and liver glycogen stores are maintained.

- If most of the glycogen in muscles and liver is used, such as after prolonged exercise, blood sugar levels can drop below normal and this can cause fatigue, nausea and dizziness.
- Carbohydrate rich foods are also important for replenishing glycogen stores after an event.



Carbohydrate requirements:

- Eating food rich in carbohydrate after exercise replenishes the store of glycogen in muscle.
- It is recommended that athletes obtain a greater proportion of energy in their diet from carbohydrate.
- This is slightly higher than what is recommended for the rest of the population and can be difficult to follow at first.

Food containing carbohydrate:

- A high carbohydrate diet can be bulky, so many athletes prefer to eat frequent meals and snacks to ensure that they consume enough energy.

Food high in carbohydrate include:

- Bread, rice, potatoes, pasta and other starchy foods.
- Foods containing sugars such as fruit, jams, table sugar, puddings and confectionary are high in sugar (carbohydrate) and can be useful before an event.
- Drinks such as fruit juice, carbonated drinks, squash and some sports drinks.

Carbohydrate loading:

- Athletes in endurance events, such as long distance running, often eat large amounts of carbohydrate for several days before the competition (up to 70% of energy).
- This is called carbohydrate loading.
- It increases the body's store of glycogen.
- Trained athletes have the ability to have greater glycogen stores as a side effect of training.



Protein needs:

- Athletes need slightly more protein in their diets than the rest of the population in order to repair and build muscle.
- Because athletes generally eat more (to meet their energy requirements) they are likely to meet their protein needs by choosing a balanced diet. They do not need to consume food high in protein.
- Athletes do not need large amounts of meat or to take supplements.

- Eating more protein than the body needs does not increase the amount of muscle in the body.

Too little energy?:

- If an athlete's diet contains too little energy from carbohydrate, protein from the diet will be used to provide energy.
- This is not desirable as less protein will be available for forming and repairing muscle tissue – the main function of protein.
- Carbohydrate should be the main source of energy. Some fat can also contribute to the body's energy source.

Hydration:

- Up to two litres of water an hour can be lost from the body during some sports, especially in hot, humid conditions.
- If fluid is not replaced, dehydration may result. This can reduce performance and can be life threatening if left untreated.
- Drinking water is suitable for most sports.
- Specially developed sports drinks may be beneficial for top class athletes.



Sports drinks – hypotonic:

- Hypotonic sports drinks contain small amounts of carbohydrate and minerals and are less concentrated than body fluids.
- The fluid from the drinks can therefore be absorbed by the body quickly.
- The carbohydrate in these drinks can also help to reduce the risk of blood glucose falling too low.
- Hypertonic sports drinks contain greater amounts of carbohydrate than hypotonic drinks – they are more concentrated than body fluids.
- They do not help prevent dehydration. Their main purpose is to provide carbohydrate to help re-fill muscles with glycogen after exercise.
- Glycogen in muscles is replaced most quickly immediately after exercise, but athletes often find it difficult to eat at this time.

Sports drinks – isotonic:

- Isotonic drinks are the same concentration as body fluids. These are absorbed as quickly as water is.
- They may be used for fluid replacement by athletes.
- Solutions similar to commercial 'Sports drinks' can be made easily at home using sugar or fruit juice and water.



Iron for a female athlete:

- Some women have very high iron requirements due to heavy menstrual losses.

- Iron is important for carrying oxygen in the blood so even a mild deficiency can affect performance.



Calcium for a female athlete:

- Calcium is important in the formation and maintenance of strong bones.
- Although moderate exercise is important in bone formation, very strenuous exercise can interrupt the menstruation cycle and cause a hormone imbalance which can lead to problems with bone health.
- It is therefore important that female athletes' diets contain adequate calcium intake.



Review of the learning objectives

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FOOD IS LIFE