

Whether you're a professional athlete or a weekend warrior, nutrition is fundamental to your athletic performance. The right diet will optimise your energy levels and help your body recover more effectively.

Energy - Fuelling your body

You need to provide your body with enough energy (kilojoules) to meet the demands of training and enable proper recovery between exercise sessions. Training or competition generally increase daily energy requirements depending on duration, type and intensity of the activity.

The three main nutrients from food that supply the body with energy are carbohydrate, fat and protein. These can be obtained by eating foods from the five food groups.

Carbohydrate

The main fuel used during exercise is carbohydrate (in the form of glucose) which is stored in muscle as glycogen. As you exercise, your muscles use the stored glycogen. Muscle can usually store enough glycogen for about 60-90 minutes of high intensity exercise, and these stores need to be replaced between exercise sessions by eating foods high in carbohydrate. Inadequate carbohydrate intake can lead to muscle fatigue which can affect performance.

Meals should be based on nutrient-rich carbohydrate foods such as cereals, breads, pasta, rice, fruits, vegetables and legumes. Milk and yogurt also provide carbohydrate in the form of the milk sugar, lactose.

Foods high in refined sugar, such as lollies, soft drink, honey and jam, also contain carbohydrate. These foods can be a useful additional source of carbohydrate for athletes with very high energy requirements. However they are not a source of protein, vitamins or minerals and should not replace nutrient rich carbohydrate foods.

How much carbohydrate?

To support training and recovery the following daily carbohydrate intakes are recommended:

- General training: 5-7g/kg body mass
- Endurance training: 7-10g/kg body mass

Protein

Protein helps repair and rebuild muscle after exercise and can also be used during exercise as an energy source, particularly when carbohydrate reserves are very low.

Protein needs of most athletes can be met by a well-balanced diet. You should consume a wide variety of high-quality protein foods such as chicken, turkey, beef, lamb, pork, fish, eggs, dairy foods, nuts and seeds. Some athletes, such as strength trained or endurance athletes often need more protein, with requirements of 1.2-1.6g

per kilogram of body mass per day. Such intakes can generally be achieved by the overall increased food intake required to fuel training. Protein supplements and shakes can be very expensive and are not usually necessary. You can make a high-protein milk drink at home at a fraction of the cost by adding skim milk powder to your normal milk drink. Skim milk powder can also be added to other meals such as soup or cereal to further boost protein intake.

Fat

Fat provides the main fuel source for long duration, low to moderate intensity exercise such as marathons. Even during high intensity exercise, where carbohydrate is the main fuel source, fat is needed to help access the stored carbohydrate (glycogen).

You should include moderate amounts of 'healthy' fats into their daily diet, such as nuts, seeds, fish, reduced-fat dairy foods, lean meat and avocados. Foods high in 'unhealthy' fat and low in other nutrients such as biscuits, pastries, chips and deep fried foods should be limited. It is generally not advised to eat foods high in fat immediately before or during intense exercise as fat is slow to digest and can remain in the stomach for a long time.

Dietary fat and weight

Athletes wanting to reduce body fat levels for performance should avoid consuming too much fat. Fats are energy dense (37 kJ/gram) compared to proteins (17 kJ/gram) and carbohydrates (16 kJ/gram). Consuming kilojoules consistently in excess of what you require daily can lead to weight gain and an increase in body fat.

Hydration

Good hydration is one of the most important nutrition priorities for athletes. During exercise your body produces sweat to help cool it down. Athletes who train for long intervals or in hot conditions can lose large amounts of fluid through sweat, which can lead to dehydration. Even small amounts of fluid loss can significantly impair performance. It is essential that you drink fluid before, during and after exercise to replace fluid lost from sweating. Keep in mind that thirst is not a good indication of fluid loss. By the time you feel thirsty your body is already dehydrated.

What is the best drink for sport?

For low intensity exercise lasting for a short duration, water is very good for rehydration. Water is cheap and convenient and sufficient for most recreational exercisers.

For high intensity and endurance sports lasting longer than 60 minutes, a drink which contains carbohydrate and electrolytes, such as milk or a commercial sports

Sports Nutrition

Hydration Tips

- Begin exercise well hydrated. Aim to drink 200-600ml prior to the event.
- Aim to drink 150-250ml every 15 minutes during exercise.
- After exercise, replace fluid losses. Weigh yourself before and after exercise. For every 0.5kg body weight lost drink 500ml fluid.
- Practice drinking at training and always make the most of breaks to top up on fluid.

drink, is generally more effective than water in enhancing performance. These drinks contain carbohydrate to help delay fatigue by providing glucose to the muscles, and electrolytes to replace sodium lost in sweat.

Important micronutrients for athletes

Iron

Iron transports oxygen to all parts of the body, including muscles, and helps release energy from cells. If iron levels are low, you can feel tired and low in energy.

Iron deficiency is a common problem for athletes, particularly women, vegetarians and adolescents. Hard training stimulates an increase in red blood cell production, increasing the need for iron. Iron can also be lost through damage to red blood cells in the feet due to running on hard surfaces with poor quality shoes, through blood loss from injury and through sweat.

It is important to regularly eat iron-rich foods such as lean meat, chicken and seafood. Vegetarians need to eat legumes, green leafy vegetables and iron-fortified cereals to obtain adequate iron intake. These foods should be combined with vitamin C-rich foods to increase iron absorption.

Calcium

Adequate calcium consumption is necessary to develop and maintain strong bones that are resistant to fracture and osteoporosis in later life. Whilst most athletes will have above average bone mass, some female athletes are at high risk of developing osteoporosis prematurely. Loss of periods (known as amenorrhoea) due to hard training and low body fat levels means that the body produces less oestrogen, which stops bones from reaching peak mass and strength.

Most athletes need three daily serves of dairy foods to help ensure they get enough calcium. A serve of dairy could include one glass (250mL) of milk, one tub (200g) of yogurt or two slices (40g) of cheese. Teenage athletes should aim for four serves to meet their increased recommended daily intake of calcium.

Dairy's role in sports nutrition

Dairy does more than build strong bones! Dairy is ideal for athletes and recreational exercisers, who want to build lean muscle, speed up recovery and rehydrate effectively.

Milk and rehydration

There is increasing interest in the use of milk as a rehydration drink. Milk naturally contains water, carbohydrate and electrolytes. A recent study found that drinking milk after exercise may promote rehydration more effectively than water or sports drinks. The researchers said it was likely that the naturally high electrolyte content of milk helped restore the body's fluid balance after exercise.

Milk speeds up recovery

Dairy products such as milk and yogurt are useful foods for post-exercise recovery because they contain carbohydrate and protein. Studies have shown that chocolate milk may be as good, or better, than sports drinks at helping athletes recover from strenuous exercise.

Dairy helps build lean muscle mass

Studies have shown that the protein from dairy food can help build and maintain muscle. Milk contains about 3.5% protein made up of casein (80%) and whey (20%). The whey protein has a high concentration of the branched chain amino acid – leucine. Leucine has been shown to specifically stimulate building of new muscle protein and dairy protein has been shown to directly stimulate muscle building.

Dairy snacks for sports

Drinks like plain or flavoured milk, smoothies and milkshakes are ideal snack options after exercise. They can also be a cheaper, yet equally effective and convenient alternative to the expensive sports supplements available.

Other examples of post-exercise recovery snacks containing dairy include:

- Drinking yogurt
- A tub of flavoured yogurt
- A cheese and salad sandwich
- Ricotta, honey and banana on toast
- Low-fat cheesy muffins

For further information on sports nutrition consult an Accredited Practising Dietitian or the Sports Dietitians Association.

