11

FACT SHEET

FUELLING FITNESS FOR THE FUTURE

SportsDietitians AUSTRALIA

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Eating & Drinking During and After Sport

During most sport your body will steadily burn a fuel mixture of carbohydrate (as glycogen) and fat. If your sport is no longer than an hour, you will perform well without having to replace those fuels until you have finished. Your next meals, if well chosen, will replace all the fuel you have used. On the other hand, you will be sweating and losing fluid very soon after you start any exercise. This fluid must be replaced as soon as possible during exercise, because even minor dehydration can impair your performance. See fact sheet number 1 on Fluids in Sport.

If your sport or training takes longer than an hour then you may benefit from consuming some carbohydrates during sport in addition to fluids eg sports drinks. The decision will depend on the:

- intensity of the exercise (higher intensity burns glycogen more quickly);
- duration (the longer the event, the more glycogen burned);
- ambient temperature (the hotter it is, the quicker glycogen will be burned); and
- how well you have eaten before sport (more pre-event carbohydrate means more available glycogen).

Carbohydrate consumed during an event may improve endurance by:

a) sparing muscle glycogen. In low intensity exercise the carbohydrates taken during the event can be re-made into glycogen for later use.

b) keeping blood glucose (sugar) levels normal during moderate to high intensity exercise and providing extra fuel for empty muscles, so delaying fatigue.

Fluids

There is no doubt you need them. Water is good for replacing fluid losses. However, sports drinks have a number of advantages, including a taste that encourages better fluid intake, and the addition of carbohydrates for glycogen fuel replacement. Glycogen replacement is beneficial if the event is an hour or more. Drink before, during and after exercise. Don't wait until you are thirsty. If you feel thirsty then you are already too dehydrated to perform at your best. (See fact sheet #1).

Sport less than 90 minutes

Most team sports and individual events are completed within 90 minutes of action eg netball, squash, football, soccer, hockey or a 10 km jog. Fluids are always very important in any exercise.

A sports drink provides some carbohydrate as sugars and can help delay fatigue in a short event or team game. It should not be necessary to eat any solid food in sports less 90 minutes duration, as eating well before the event will have a big impact on sports performance, and a sports drink provides plenty of opportunity to refuel during the event. If you fatigue during the event then you probably haven't:

- eaten enough carbohydrates beforehand;
- taken enough sports drink;
- trained enough; or
- you have overtrained

You will perform better by rectifying these problems and refuelling and re-hydrating during the game.

Sport longer than 90 minutes

Generally, these are endurance events. Most fit people can exercise for 90 minutes or more if they are well fuelled with carbohydrates before they start. Unfortunately, there isn't a never ending supply of glycogen fuel, so in endurance events it is recommended that extra carbohydrate is consumed, usually in the form of a sports drink or easy-to-eat food bar or sugar confectionery.

The sugars found in a sports drink will help delay fatigue and allow you to compete at your optimal pace for a longer time. If you eat solid food to supply additional carbohydrate, then it will need to be a choice that you feel comfortable with. For example, jelly beans, jelly snakes, muesli bars (low fat, of course) and bananas are popular solid foods with long distance cyclists. Studies of athletes show that around 30-60g of carbs per hour should be consumed in an endurance event to delay fatigue. This is the equivalent to 500- 1000 mL of sports drink or 10-20 jelly beans. You should experiment to find a fuel replacement schedule that suits your individual needs.

Ultra-endurance events

For events over four hours, the ultra-endurance athlete trains and competes at a lower intensity than short-distance events and most team games. During exercise at less than 70% maximum heart rate digestion can still occur, so the athlete can consume high carbohydrate foods with small amounts of protein and fat eg muesli bar, breakfast bar, sports bar, jam sandwich and hot soups (if the event is held in cold conditions).

Commercial liquid meals are popular with ultra-marathoners. Ultra-endurance athletes should invest the help of an experienced sports dietitian due to their very high energy and nutrition requirements. Many will need over 20 000 kJ (4 800 Calories) a day just to maintain their body weight and get enough carbohydrates.

As glycogen stores get low, protein is used as a muscle fuel. Even if glycogen stores are reasonable, a small amount of protein is used as a fuel source near the end of endurance events, therefore endurance athletes need more protein than sedentary people (see fact sheet #6 on protein).

Why should I eat and drink after exercise?

When you have completed a training session or an event you will have used:

a) muscle glycogen;
b) body fat (usually a small amount);
c) some protein (mainly in endurance events or weight training); and
d) lost some fluids

Most importantly, fluids and carbohydrates need to be replaced soon after exercise. Muscle glycogen is likely to be depleted and these are restored by consuming food or drinks containing carbohydrate. Fluid must be replaced as quickly as possible because being even slightly dehydrated will affect your performance, your recovery and your daily activities, such as thinking and driving a car. Fortunately, even if you are quite lean, you will likely have plenty of body fat stores for endurance work, and these can be replaced at your next meal. Protein is another nutrient that can easily be replaced at your next meal (note that many carbohydrate foods also provide protein eg breads, pasta, rice, legumes).

When should I eat and drink after exercise?

To take advantage of the body's desire to replace glycogen stores after exercise, we recommend that a post-event snack be eaten within two hours after exercise, although the first 30 minutes may be the most crucial time. The body replaces glycogen at the quickest rate when carbohydrate foods and drinks are eaten soon after exercise. This becomes very important when an athlete trains or competes two or more times a day and they need to replace glycogen quickly. A larger meal can be consumed later when an athlete has cooled down and feels more comfortable. Muscle glycogen can generally be replaced at 5% per hour, so it takes about 20 hours to replace an empty glycogen fuel tank.

What should I eat after sport?

As a guide, your choice of meal or snack should be:

- high in carbohydrate;
- moderate protein;
- include plenty of fluids; and
- food & drinks you enjoy

Don't fall for the trap of eating anything you fancy because 'you deserve it'. For most events, the emphasis is on replacing carbohydrates and fluids. Athletes who find it difficult to eat solid food after exercise should try liquid sources of nutrition.

Liquid meals, such as commercial high carbohydrate drink supplements and home-made fruit smoothies (a blend of milk and fruit), fruit juice and sports drinks help an athlete to both refuel and replace fluids even when they are not as hungry. Try to eat 1-2 g of carbohydrate per kg body weight in the two hours after exercise. This will equate to around 50-160 g carbohydrate for most people. There may be some good reasons for choosing carbohydrate foods that are also good sources of other nutrients such as protein and vitamins or minerals. Speedy intake of these nutrients may assist in a variety of recovery activities, such as rebuilding protein or assisting the immune function. Nutritious carbohydrate foods and meal ideas are provided below.

Post-exercise snack ideas

- Sports drinks
- Banana sandwich
- Fresh fruit, canned fruit
- Fruit juice
- Sweet muffins
- Fruit bar
- Breakfast bar, muesli bar
- Sports bar
- Low-fat flavoured yogurt
- Fresh fruit salad with low-fat yogurt or low-fat dairy dessert
- Smoothie, based on reduced-fat milk, low-fat yogurt and banana/mango/berries
- Soy smoothie, based on reduced-fat soy beverage and blended fruit.

Example high carbohydrate meals & snacks

- Baked potato (1 med) + baked beans & mushrooms = 30 g carb
- 200mL low fat yogurt + 1 Tbsn dried fruit = 35g carb
- Fruit smoothie (200 mL low-fat milk + banana) = 37 g carb
- Breakfast cereal (1 cup) + 150 mL low-fat milk + tinned peach (1 whole) = 40 g carb
- Raisin bread (2 slices) + ricotta cheese + jam = 45 g carb
- Ham & salad roll + fresh fruit = 50 g carb
- Spaghetti or baked beans (1 cup) + 2 slices toast = 55 g carb
- Breakfast cereal (2 cups) + 200 mL low-fat milk + tinned fruit (1/2 cup) = 70 g carb
- Toast (2 slices) with honey, jam or marmalade + fruit juice (1 glass) = 70 g carb
- Steamed rice (1.5 cup) + stir-fried vegetables = 85 g carb

Summary points

- During sporting activities, it is important to replace lost fluid as soon as possible
- In longer activities, both fluids and carbohydrates will need to be replaced to enhance endurance ability
- Consume 30-60 g carbohydrate per hour during endurance events.
- For the quickest replacement of glycogen stores, eat 1-2 g of carbohydrate per kg body weight soon after finishing exercise