



FACT SHEET

Sports Drinks

For optimal performance, athletes need to be hydrated and adequately fuelled during exercise. Exercise scientists have extensively researched the best fluid to drink during exercise. Sports drinks, or to be more specific, carbohydrate electrolyte drinks, are one of the best researched nutrition supplements available to athletes. Today's market has many beverages available that are marketed in association with sports or exercise, so that the term 'sports drinks' has become a little confusing. This fact sheet discusses the 'traditional' sports drink (beverages with the appropriate balance of carbohydrate and electrolytes) as well as the more recently available sports waters and energy drinks. Refer to Comparison of Fluids table to compare the nutritional content of these various types of beverages. Sports drinks are designed to provide both carbohydrate and fluid, such that they empty quickly from the stomach and are rapidly absorbed from the small intestine. When used according to sports nutrition guidelines, sports drinks can enhance sports performance (see Fact Sheet [Eating & Drinking Before Sport](#) and Fact Sheet [Eating & Drinking During & After Sport](#)).

What's in a sports drink?

1. Carbohydrate

Carbohydrate provides a fuel source for the muscles and brain, and contributes to the flavour of sports drinks. When the carbohydrate concentration is below 8%, both carbohydrate and water are rapidly absorbed from the small intestine. As carbohydrate concentration increases beyond 8%, water absorption slows. Sports drinks use glucose, glucose polymers, sucrose and fructose as a carbohydrate source, with a total carbohydrate concentration of 4-8% (4-8 g/100 mL). Replacing glucose with glucose polymers may help to improve the rate at which carbohydrate and fluid empties from the stomach. Small amounts of fructose are included to improve the flavour of sports drinks, and to supply a different form of carbohydrate that improves the absorption rate.

2. Electrolytes

Sports drinks include the electrolytes sodium and potassium. Some also include magnesium, although there is no evidence that this improves sports performance. Sodium stimulates the absorption of both carbohydrate and water from the small intestine. It stimulates thirst receptors, so you are encouraged to drink more and hence replace fluids faster. Most sports drinks contain 10-25 mmol/L sodium. Higher levels of sodium encourage better fluid retention during re-hydration. However, the higher the sodium, the less palatable is the drink, so manufacturers offer a formula that meets the needs of most athletes while also tasting good.

3. Flavour

Flavour is an important feature of sports drinks. The more you enjoy the flavour of a drink, the more you drink. Most athletes replace only half their fluid losses during exercise, and fail to fully re-hydrate after exercise. Fluid intake via sports drinks is significantly better when compared to plain water.

4. Other Ingredients

Some beverages marketed as sports drinks have other added ingredients e.g. vitamins, minerals, protein and herbs. Currently, there is little evidence to support the addition of substances other than carbohydrate and electrolytes. The extra ingredients tend to increase the price and often have adverse effects on flavour.

Will sports drinks improve performance?

Generally, yes. The extent to which sports drinks help performance depends on factors such as type of exercise, pre-exercise nutrition and the length of exercise. All types of effort will benefit from the fluid provided by sport drinks. Carbohydrate intake during exercise has been shown to enhance performance in the following situations:

- Prolonged (more than 90 min) sessions of constant lower intensity (60-80% of max) exercise (e.g. cycling, running)
- Prolonged periods (more than 60 min) of intermittent high-intensity exercise (80-100% of max) (e.g. team games, interval training)
- High intensity exercise (80-100% of max) lasting 60 minutes or more (e.g. sprint triathlon)
- Any athlete who has heavy sweat losses

When should sports drinks be used?

1. Before Exercise

Sports drinks are ideal in the hour before sport. The carbohydrate tops up muscle glycogen fuel levels, while the added sodium reduces urine losses before exercise begins.

2. During Exercise

Sports drinks are primarily designed for use during exercise, for optimal fluid and fuel delivery. They will allow the athlete to perform for longer and more effectively in training and competition.

3. Recovery

Sports drinks greatly assist re-hydration. When aggressive re-hydration is required, drinks with a higher sodium content may be more useful. For complete recovery, sports drinks need to be consumed with a food source that provides carbohydrate, protein, vitamins and minerals.

June 2007

© This is a sports nutrition publication of Sports Dietitians Australia.

Phone (03) 9926 1336 • Fax (03) 9926 1338 • Email info@sportsdietitians.com.au • Website www.sportsdietitians.com

Comparison of fluids

Fluid	Carbohydrate %	Carbohydrate Type	Sodium (mg per 100 ml)	Other Added Ingredients
Sports Drink	4-8	sucrose glucose	20-60	potassium
Sports Water	0-4	sucrose fructose	0-12	potassium vitamin E vitamin C B vitamins herbs
Tap Water	0	NA	3-15 usually, depending on supply source	NA
Fruit Juice	8-12	fructose glucose	7	NA
Cordial	10-12	sucrose	12	NA
Soft Drink	10-14	sucrose	10	NA
Energy Drink	10-13	sucrose glucose	10-120	taurine glucuronolactone caffeine inositol B vitamins

NA = not applicable

Fluids other than sports drinks

1. Sports Water – a new drink designed for those who prefer to drink water during exercise. They are lightly flavoured with a lower carbohydrate and electrolyte content than sports drinks. They may be a suitable option for moderate exercise of less than an hour.

2. Water – absorbed as quickly as sports drinks. Voluntary fluid intake is less when drinking water compared to flavoured drinks. Water is suitable for low intensity or short duration (less than 45 mins) exercise, or in addition to sports drinks.

3. Cordial/Soft Drink/Fruit Juice – generally they are too high in carbohydrate and too low in electrolytes for ideal fluid replacement. Carbonation in soft drink decreases voluntary fluid intake.

4. Energy Drinks – carbohydrate concentration is generally too high. They contain added ingredients such as vitamins, taurine and glucuronolactone. Current evidence suggests that these additives have no impact on sport performance. On the other hand, caffeine has been shown to enhance the performance of a variety of types of sports, with recent evidence that for endurance events, small to moderate doses (75- 150 mg) are as effective as larger doses. Caffeine is no longer banned by the World Anti Doping Agency. Ensure that you use with the advice of a sports scientist or sports dietitian and consider individual responses to caffeine.

Popular sports drinks

Fluid	Carbohydrate %	Carbohydrate Type	Sodium per 100 mL	Other
Gatorade	6	sucrose glucose	41 mg (1.8 mmol)	potassium
Powerade	8	sucrose maltodextrin (glucose polymer)	25 mg (1.1 mmol)	potassium
Adams Ale Sport	6	sucrose glucose fructose	23.5 mg (1.0 mmol)	potassium
Staminade Sport	6.8	sucrose glucose fructose	27.5 mg (1.0 mmol)	potassium magnesium
PB Fluid and Electrolyte Replacement	6.8	maltodextrin (glucose polymer) fructose	58.0 mg (2.5 mmol)	potassium magnesium

Common misconceptions about sports drinks

1. Sports drinks are high in salt

The sodium in sports drinks plays a valuable role in improving fluid absorption and the desire to drink. Sodium plays a role in preventing hyponatraemia (low blood sodium), particularly in very long sports events (e.g. iron man triathlons). Sports drinks have a similar sodium content to foods such as milk, bread and breakfast cereal, but are much better tolerated during exercise!

2. Sports drinks are not suitable for children

Children have a poor voluntary fluid intake during exercise and therefore are at greater risk of heat illness. Sports drinks have been demonstrated to improve voluntary fluid intake in children during exercise.

3. Sports drinks should be diluted

In almost all exercise situations sports drinks should not be diluted as this reduces the amount of carbohydrate available, changes the sodium concentration (both of which can affect the speed at which the drink empties from the stomach) and changes the flavour. A more dilute drink may be preferable if normal dilution is poorly tolerated or where more fluid is needed than carbohydrate e.g. light activity in hot conditions.

4. Sports drinks cause gastrointestinal upset

Sports drinks don't cause gastrointestinal upset when consumed in volumes matching current sports nutrition guidelines. You should experiment with sports drinks in training before using them in competition. Not drinking enough sports drink or drinking a lot in a short period of time can cause gastrointestinal upset. Drink small amounts frequently to minimise problems.

Dental health

Sports drinks are acidic. Acidic foods and fluids are one of the factors linked to tooth enamel erosion. Other acidic fluids include fruit juice, soft drink, wine, beer, tea and coffee. The use of sports drinks alone is unlikely to cause dental erosion as saliva will quickly buffer the acids. Despite this, athletes who use large quantities of sports drinks for prolonged periods (e.g. endurance cyclists) should pay extra attention to dental hygiene. Squirting sports drinks into the back of the mouth and rinsing the mouth with water minimises sports drink contact with teeth.

Summary

- Sports drinks are very well researched and can definitely improve sports performance when used properly.
 - Sports drinks provide carbohydrates and electrolytes.
 - The carbohydrates supply the muscles with fuel during sport.
 - The main electrolyte is sodium, which improves the flavour and water absorption.
 - Sports drinks are best suited to endurance sports and high intensity sports.
 - See Fact Sheet [#1](#) for more information on fluid replacement
- The best sports drink depends on personal taste preferences and individual tolerance. Sports drinks are intended to cater for the majority of exercise needs most of the time but will not meet every individual's needs. When undertaking unusual sports or extreme exercise, it is best to discuss drink choice with a sports dietitian.