

# Sports Drinks for Hydration during Exercise

---

Sports drinks can be an important piece of an athlete's training nutrition. When you exercise you lose water through sweating and you use up energy from your muscle called glycogen. Glycogen is made up of carbohydrate and is your main fuel source during intense activity.

Sports drinks are designed to provide you with adequate hydration and carbohydrates for energy to replace losses during workouts or competition. A sports drink may be a better option than water to maintain performance when:

- The exercise is intense (e.g. soccer, hockey, basketball or interval training)
- The activity lasts longer than 1 hour
- You sweat a lot and notice cakey white salt lines on your clothes
- You wear a lot of protective equipment like in hockey or football
- The weather is hot and humid
- Your fluid needs to be quickly replaced (e.g. during soccer tournaments or two-a-day training sessions)

## WHAT MAKES A GOOD SPORTS DRINK

The amount of carbohydrate in a sports drink is critical to how well they are digested. The optimal concentration of carbohydrates is 4 to 8 grams per 100 ml. This is the concentration that is easiest for your body to digest and absorb quickly.

Beverages like fruit juice, fruit drink and soda pop typically have a concentration that is too high, which will likely result in stomach cramping if consumed immediately before or during activity. Soda pop is also carbonated which is another factor that can slow down absorption speed and add to stomach discomfort during exercise.

Other important nutrients typically found in sports drinks are sodium and potassium. These minerals, which are also known as electrolytes, are also lost in sweat. Having them in a sports drink both replaces those losses and aids the absorption of fluid from the gut. Along with the correct concentration of carbohydrate, this keeps the fluid from sitting too long in your stomach.

You may also find protein in certain sports drinks. However, current research suggests that protein does not aid in performance when consumed during exercise. It also does not assist with absorption of the fluid. A sports drink with both carbohydrate and protein may be more suitable as a post-exercise recovery beverage if needed.

# HOW MUCH

Both dehydration and depletion of the body's carbohydrate stores can cause fatigue and a decrease in performance. This is why it is important to have a steady intake of both fluid and carbohydrate. The amount of carbohydrate recommended is 30-60g (or 0.7 g/kg) per hour of exercise depending on intensity and the amount of time spent resting during the activity. This would be equal to about 430 ml for 30g of carbohydrate and 860 ml for 60g of carbohydrate from a sports drink with seven grams of carbohydrate per 100 ml.

If you are involved in a sport that results in less fluid being lost as sweat compared to others, you may find that you do not need this much fluid to maintain hydration. In this case, sports gels or sports bars may be a better option to replace losses of carbohydrates.

## Special Considerations

### Energy Drinks

Athletes typically go through periods of fatigue due to their frequent training, so it is understandable that you may be tempted to go for a product that is marketed as "energy".

Most energy drinks are carbonated and contain a large amount of both caffeine and carbohydrate. The immediate feeling of "energy" is most likely primarily due to the stimulating effect of the caffeine. However, the concentration of carbohydrate tends to be higher than that which is recommended in sports drinks for optimal digestion and hydration. The caffeine, carbonation and concentration of carbohydrates are all likely to cause stomach upset and decrease performance if consumed before or during activity. For this reason, energy drinks are not recommended as a source of hydration or a replacement for sports drinks.

Sports drinks and energy drinks are not recommended as a source of fluid for hydration throughout the day away from activity. Both have large quantities of calories from carbohydrates and lack nutrients that whole foods contain. Consuming them regularly can result in unwanted weight gain.

Sawka MN, Burke LM, Eichner ER, Maughan RJ, Montain SJ, Stachenfeld NS. American College of Sports Medicine position stand. Exercise and fluid replacement. *Med Sci Sports Exerc.* 2007;39:377-390.

LINDEMAN, R. D. Renal physiology and pathophysiology of aging. *Contrib. Nephrol.* 105:1–12, 1993.

Heckman MA, Weil J, Gonzalez de Mejia E. Caffeine (1, 3, 7-trimethylxanthine) in foods: a comprehensive review on consumption, functionality, safety, and regulatory matters. *J Food Sci.* 2010 Apr;75(3):R77-87. Abstract available from: <http://www.ncbi.nlm.nih.gov/pubmed/20492310>

Coggan AR, Coyle EF. Carbohydrate ingestion during prolonged exercise: effects on metabolism and performance. *Exerc Sport Sci Rev.* 1991;19:1-40.

Currell K, Jeukendrup AE. Superior endurance performance with ingestion of multiple transportable carbohydrates. *Med Sci Sports Exerc.* 2008;40:275-281.

Passe DH, Horn M, Murray R. The effects of beverage carbonation on sensory responses and voluntary fluid intake following exercise. *Int J Sport Nutr.* 1997;7(4):286-97. Abstract available from <http://www.ncbi.nlm.nih.gov/pubmed/9407255>

Rodriguez NR et al. Nutrition and Athletic Performance. *Med Sci Sports Exerc* 2009;41:3.

Murray R. The effects of consuming carbohydrate-electrolyte beverages on gastric emptying and fluid absorption during and following exercise. *Sports Med.* 1987 Sep-Oct;4(5):322-51.

Malik VS, Schulze MB, Hu FB. Intake of sugar-sweetened beverages and weight gain: a systematic review *Am J Clin Nutr.* 2006 Aug; 84(2): 274–288.