Nutrition

Fact Sheet

Fueling the School-Aged Athlete – Sports Drinks

Playing It Cool

Many school-aged athletes consider their water bottle to be a part of standard sports equipment. They have learned that replenishing fluid lost during exercise is important. A deficit in body water or dehydration can cause heat illness which can potentially be life-threatening. Children and adolescents dehydrate more easily than adults for a number of reasons. They have a higher ratio of body surface area to body mass, produce more heat during exercise, are less efficient at transporting heat to the skin, and sweat less (American Academy of Pediatrics [AAP], 2005; Meyer, O'Connor, & Shirreffs, 2007; Squire, 1990). Young athletes can easily dehydrate by not drinking enough fluids even when they are available because their thirst may be blunted. A study of participants in summer, youth soccer, and football camps found no relationship between perception of thirst and dehydration (Yeargin et al., 2005). Thirst alone was not enough to drive young athletes to drink and stay hydrated.

Keeping athletes well hydrated prevents dehydration which can hinder performance and body temperature regulation. Evaporation of sweat helps disperse heat produced by working muscle, cool the skin and underlying blood, and keep body temperature at a normal level. Sweat is made up of about 99% water and 1% salt (electrolytes) and other minerals.

Many consider plain, cool water to be the best rehydration fluid because it

- cools the body from the inside out,
- empties quickly from the stomach, and
- replaces sweat losses.

For sports that require less than 60 minutes of exertion, the main concern is replacing water because loss of electrolytes like sodium, chloride, and potassium in sweat is not very great. These electrolytes can easily be replaced later by eating fruits and vegetables rich in potassium like tomatoes, oranges, and potatoes and also pickles, ham, cheese, salted snacks, or processed commercial foods which are excellent sources of sodium and chloride.

The Score on Sports Drinks

For events longer than 60 minutes, water loss can be greater than for shorter time periods, carbohydrate stores can be used up, and the loss of electrolytes will increase. Based on several studies, the American College of Sports Medicine (ACSM) (2007) reported that consuming carbohydrates during intense exercise events lasting an hour or longer and less intense exercise occurring for prolonged periods helped sustain exercise performance. Replacing electrolytes like sodium can stimulate thirst, enhance water absorption from the intestine, and help maintain blood volume (American Dietetic Association [ADA], 2009; McArdle, Katch, & Katch, 2008). For endurance, athletic sports drinks can provide a convenient way to get fluids, carbohydrates, and electrolytes.

All beverages, such as juice, lowfat milk, and soft drinks contain water and contribute to hydration. However, sports drinks also contain additional ingredients like sugars, starch, electrolytes, flavorings, color, and sometimes vitamins and other minerals.

Sports Drinks versus Water

Sports Drinks

- Taste good
- Provide fluid
- Provide carbohydrates
- Provide electrolytes
- Associated with athletes - may provide a psychological advantage

Water

- Not much taste
- Provides fluid
- Calorie free
- Sugar free - healthier for teeth
- Low cost

Readily available sports drinks containing 6–8% carbohydrate and 0.5–0.7 grams of sodium per liter are recommended for intense exercise events lasting 60 minutes or longer (ACSM, 2007; McArdle et al., 2008). Beverages with higher amounts of carbohydrates could delay stomach emptying and cause bloating or cramps. The strength of sodium in sports drinks is less than the concentration of sodium in sweat (Meyer, Bar-Or, Salsberg, & Passe, 1994). The main purpose of sodium is to add flavor; although, it will provide a small amount of electrolytes. Many sports beverages like bottled water, enhanced water beverages, sports drinks, and energy drinks are now available. Let the ingredients and Nutrition Facts on the containers serve as a guide. Some beverages like soda or undiluted fruit juice are higher in carbohydrates and contain little sodium. To calculate the percent of carbohydrate in a beverage divide the grams (g) of total carbohydrate listed on the Nutrition Facts label by the milliliters (ml) in one serving and multiply by 100. Remember, drinks higher than 8% carbohydrate, consumed during competition, might cause nausea, cramping, or diarrhea.

When exercising less than 60 minutes, plain, cool water is the best sports drink!

14 g carbohydrate ÷ 240 ml serving = 0.058 x 100 = 5.8% carbohydrate

Water Works

Endurance athletes may benefit from drinking sports beverages; but for the majority of young athletes, water remains the preferred choice for replenishing fluids during exercise (ADA, 2009; Squire, 1990). Yet much of the research on hydration has been done with adults and applied to children even though they are at a disadvantage when it comes to body temperature control (Meyer et al., 2007). Studies have shown greater fluid intake in children and adolescents when sports drinks or flavored water are offered (Bergeron, Waller, & Marinik, 2006; Meyer et al., 1994; Rivera-Brown, Gutiérrez, Gutiérrez, Frontera., & Bar-Or, 1999; Wilk & Bar-Or, 1996). When compared to plain water, a carbohydrate-electrolyte beverage enhanced the voluntary drink intake of boys with very high sweating rates when exercising in a tropical climate (Rivera-Brown et al., 1999). However, a comparable study in girls found that this beverage was not more effective than water in stimulating voluntary fluid intake (Rivera-Brown, Ramirez-Marrero, Wilk, & Bar-Or, 2008). It appears drinking behaviors are different among boys and girls. Girls may be more motivated to drink what is available because they are more health and safety

conscious (Rivera-Brown et al., 2008). Further research in children and adolescents is necessary to understand the role of physiology and behavior on fluid intake and to provide appropriate guidance.

Plain water is an appropriate hydration fluid for activities lasting less than one hour, and sports drinks are not necessary (ADA, 2009). Under certain circumstances, such as exercising hard for over an hour or exercising less intensely for a longer time, drinking beverages containing electrolytes and carbohydrates may provide advantages over plain water (AAP, 2005; ACSM, 2007). Young athletes should be encouraged to drink water during exercise. They may prefer the flavor of sports drinks; however, it is important to remember that a 32 ounce bottle of a sport drink contains about 200 calories. Plain water can get the job done without added calories.

For More Information

American College of Sports Medicine. www.acsm.org
American Dietetic Association. www.eatright.org
Best Beverage Bets. www.opi.mt.gov
Bottled Water Basics. www.epa.gov
Energy Drinks: Power Boosts or Empty Boasts? family.samhsa.gov
How to Understand and Use the Nutrition Facts Label. www.cfsan.fda.gov
President's Council on Physical Fitness and Sports. www.fitness.gov
Nutrition for Everyone: Basics: Water. www.cdc.gov
SCAN–Sports, Cardiovascular, and Wellness Nutritionists – A Practice Group of the American Dietetic Association. scandpg.org

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For more information, contact NFSMI at 800-321-3054 or www.nfsmi.org.

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