FOR SOCCER PLAYERS

Key challenge: *Soccer matches are long and involve infrequent stoppages, few substitutions, and substantial amounts of high-intensity action. Therefore, soccer matches often result in large fluid losses due to sweating and significant depletion of muscle glycogen stores.*

Late in the game, players tend to become dehydrated and fatigued. This can lead to costly mistakes (goals allowed) and injuries. Approximately 30 percent of goals are scored in the last fifteen minutes of games. In the France World Cup, nearly 50 percent of all goals scored in the quarterfinals, semifinals, and final match were scored in the last twenty minutes of each game.

Recently, my colleagues and I completed a three-year study on youth soccer injuries. We found that nearly 25 percent of soccer injuries occur during the last ten to fifteen minutes of games. This is similar to findings in the Premier League in England. Fatigue appears to be an important factor in the disproportionate occurrence of injuries late in matches. When players get tired, their reaction time slows and their judgment deteriorates.

Josh Wolff

The best way to limit net fluid losses and conserve muscle glycogen stores is, of course, to frequently consume a sports drink throughout games. However, due to the infrequency and brevity of stoppages and the sheer size of the playing field, drinking opportunities can be few and far between.

In order to maximize these opportunities, teams should arrive at each game supplied with at least one large squeeze bottle per player filled with a cold sports drink. Several bottles should be placed around the perimeter of the field, a couple of bottles in each goal, and several more at the bench. Coaches should encourage

by Don Kirkendall, Ph.D.

their players to drink from the nearest bottle once every ten to fifty minutes, when an opportunity presents itself. The hotter the weather, the more frequently players should drink.

At halftime, players should drink at least 6–8 ounces of a sports drink. It is also helpful to drink several ounces within ten minutes before the start of a game. Remember, not all sports drinks are the same. A fluid and electrolyte drink is not the same as a carbohydrate replacement drink. Tests have shown that sports drinks containing carbohydrate and protein in the right balance are most effective in keeping carbohydrate levels up. (Most sports drinks have no protein.) The carbohydrate provides the fuel source while the protein helps get the fuel into the muscles more quickly.

A recent study performed at St. Cloud State University compared the effects of a sports drink containing carbohydrate and protein to a sports drink containing only electrolytes on sprinting speed at the end of a long training session. Following an intense workout of seventy-five minutes, the subjects participated in four speed trials with five minutes of rest after each sprint. Half the players drank the carbohydrate/protein drink while the other half drank an electrolyte-only drink. The carbohydrate/protein group actually improved their speed by 1.1 seconds between the first and last sprints, while the other group decreased their speed by 2.2 seconds.

As soon as the game is over, players should consume another 10–16 ounces of a carbohydrate/protein sports drink to accelerate muscle recovery. This is especially important in tournament situations when another game might follow in the afternoon or next morning.

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Nutrition Focus

FUELING THE YOUNG ATHLETE

by Jeffrey Stout, Ph.D.

The young athlete in your family has a competition this morning. She starts the day with a breakfast of cereal and milk and washes it down with a glass of orange juice. That's the last time she has anything to eat or drink until halftime, when she has some water or a sports drink. Afterward, the players celebrate the game's completion (and possibly their victory) with a snack, such as potato chips and soda.

Well, the breakfast wasn't bad, but everything your young athlete did or didn't do in terms of in-game and postgame nutrition decreased her ability to play well, increased the likelihood of injuries, and greatly limited her ability to recover from the physical stresses of the game. Don't feel bad. Few parents think beyond breakfast when it comes to sports nutrition, and coaches, particularly at the youth level, are often too busy to worry about nutrition during the game.

The nutrition young athletes take in before, during, and after games or practices is critical to their performance. There are three factors you should consider when refueling a young athlete. Just think of the three Rs: Rehydrate, Replenish, Recover.

REHYDRATE

Dehydration, particularly among young athletes, is associated with heat-related injuries. Heatstroke is the second leading cause of death among high school athletes. Even in professional sports with well-trained doctors and coaches, athletes routinely fall ill due to heat exhaustion. In young athletes, however, the risks are even greater. There are a number of reasons for this. Young athletes sweat at a lower rate. Sweating is the primary mechanism for keeping body temperature cool. As a result, young athletes tolerate temperature extremes less efficiently than adults. They get hotter during exercise. For all of these reasons, fluid replenishment, which increases sweat rate, is the number-one objective of exercise nutrition for the young athlete.

It is also important to keep in mind that using thirst as a cue to drink is not a reliable way to prevent dehydration. By the time we are thirsty, we have already entered the first stage of dehydration. A 2 percent reduction in body weight from fluid loss can lead to a significant decline in muscle strength and endurance and an increase in fatigue. That's only 2 pounds for a 100-pound athlete.

Rehydrating the young athlete must begin during competition and training. The young athlete should drink 3–4 ounces of water or sports drink every ten to fifteen minutes. For teens, the requirement increases to 4–8 ounces every fifteen

minutes. After exercise, the young athlete should drink 20 ounces of water or preferably a sports drink for every pound of weight loss.

REPLENISH

Glycogen is the major fuel used to generate muscle energy. During extended exercise, such as a soccer game, muscle glycogen stores are depleted. Studies have shown that when this occurs, the body becomes fatigued, and there is a strong link between muscle fatigue and injuries. Consuming a sports drink with carbohydrate or perhaps one of the newer protein-containing sports drinks not only will provide your child with the fluid his or her body needs, but will also delay the depletion of muscle glycogen. The carbohydrate/protein drinks can also help your child recover faster, which is particularly important in tournaments when playing two or three contests per day is not uncommon.

RECOVER

The forty-five-minute interval immediately following a game or practice is critical if you want your child to recover rapidly and play at his or her best the next time. Snacks like potato chips and soda couldn't be worse. Carbonation in a soda makes athletes feel fuller faster so they drink less, which means they may not fully replenish the fluids lost during the game. Potato chips, candy, and the like are high in fat, which hampers the ability of the muscles to initiate repair processes and replenish muscle glycogen. Ideally, the post-practice or postgame meal should be high in carbohydrate (0.4–0.8 grams per pound of body weight) with some protein (0.1–0.2 grams per pound of body weight) within fifteen to thirty minutes of completing exercise.

There are few other factors that can match the potential of sports nutrition to enhance the play of your child or the child you coach. With a little knowledge and effort, you can fuel your young athletes to play better, safer, and longer.

NUTRITION GUIDELINES FOR YOUNG ATHLETES

	Good Choices	Bad Choices
Before Practice and Games	High-fiber breakfast cereal, sandwich, fruit, energy bar, sports drink, water	Eggs, whole milk, beans, soda, snack chips
During Practice and Games	Sports drink with protein	Fruit juice, any solid food
After Practice and Games	Sports drink with protein, fruit, energy bar	Snack chips, fast food, soda

Jeffrey Stout, Ph.D., is coauthor of *Fit Kids for Life: A Parent's Guide to Optimal Nutrition and Training for Young Athletes* (Basic Health Publications, 2004).