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| **Sports Science Exchange 94** **CREATINE, CARBS, AND FLUIDS:HOW IMPORTANT IN SOCCER NUTRITION?** **Donald T. Kirkendall, Ph.D., FACSM**Sports Medicine Committee, US Soccer Federation([http://www.gssiweb.com/Article\_Detail.aspx?articleid=696](http://www.gssiweb.com/Article_Detail.aspx?articleid=696" \t "_blank)) |

There is no persuasive evidence that creatine supplementation is beneficial to soccer play. Because most of the running in soccer is at less than maximal speed, it is unlikely that creatine supplementation would have any important benefits.
On the other hand, soccer is a glycogen-dependent sport, making carbohydrate feedings repletion of critical importance. Therefore, the ability to sustain late-game running speed and goal-scoring and to avoid injuries are dependent on glycogen levels. Adequate dietary carbohydrate in the days and hours before strenuous training and competition is critical to maintaining adequate glycogen levels in the muscles. Similar to the detrimental effect of inadequate carbohydrate intake, even slight dehydration can be detrimental to impair performance in soccer, and sports drinks containing moderate amounts of carbohydrate and electrolytes, especially sodium, are better than plain water in maintaining hydration during soccer play and in rehydrating during recovery. **Soccer players typically do not eat enough carbohydrate and begin soccer matches with less than optimal stores of muscle glycogen. Moreover, they usually do not drink enough fluids during practice and competition to adequately replace their sweat losses.** Coaches and athletic trainers must continually reinforce the need for dietary carbohydrate and fluid replenishment, ensure that fluids are available on the sidelines, and, when possible, supervise the eating and drinking behavior of the players. All levels of play can benefit by following sound nutritional guidelines.

**Myth #2 – If any type of food is critical in soccer nutrition, it’s protein, not carbs.**
With rare exceptions, soccer players in developed countries get plenty of protein in their normal diets. But players on most teams eat too little carbohydrate, the most important nutrient in the successful soccer player’s diet. Hard sprinting and running in soccer rapidly uses up the stored glycogen (carbohydrate) in your muscles and liver. To replace that glycogen, you should emphasize carbohydrate foods in your daily diet, especially during the 24 hours before a match and during the first few hours of recovery from matches or hard training sessions. Here are some guidelines:

* Your in-season daily diet should include 8-10 grams of carbohydrate per kilogram of body weight (3.5-4.5 g/lb). Cereals, fruits, vegetables, breads, and pastas are good sources of carbs.
* About 4 hours before a match, eat a meal that includes plenty of easily digestible, carbohydrate-rich foods. Avoid fried foods and foods with fatty sauces because fats are slowly digested. If you tend to be nervous before a match, consider an easy-to-digest liquid meal such as a nutrition shake that contains 60-70% of its calories as carbohydrate.
* About 2 hours before a training session or match, drink about 500-600 ml (16-20 oz) of a carbohydrate-electrolyte sports drink that contains 5-7% carbohydrate. This will provide some last-minute carbohydrate and body fluids insurance.
* During stoppages for injuries and penalties and during half-time, drink as much of a carbohydrate-electrolyte sports beverage as you can comfortably consume.
* As soon as possible after a match or hard training session, start consuming carbohydrate-rich foods and beverages to rapidly begin replacing glycogen stores. Energy drinks that contain 18-20% carbohydrate (18-20 g/100 ml or 43-48 g/8 oz) can be a good source of easily digested carbs. A little protein is good, but don’t go overboard. Aim to consume plenty of carbohydrates (8-10 g/kg) in the 24 hours following strenuous play.

**Myth #3 – Drinking fluids during practice and matches is for sissies.**
If you play hard in practice and in matches, you lose lots of sweat, especially when it’s hot and humid. Some of the water in that sweat comes from your blood, and the last thing you want to do is reduce your blood volume. Blood carries oxygen and nutrients to your muscles, removes lactic acid and other substances, and transfers heat away from your muscles to your skin, where the heat is released to the air. If you do not replace most of the fluids you lose in sweat, your performance will deteriorate and you may become susceptible to muscle cramps, heat exhaustion, and even heat stroke. Each player should have individualized, chilled, well-marked fluid containers, and teams should place those containers about every 20 meters along the sidelines, readily available for a quick drink during play stoppage.