

# Nutrition and Soccer Performance

**By Dr. Donald Kirkendall**

You wouldn't put low octane gasoline in a racecar, would you? Yet, even today, with all the research on nutrition and athletic performance, athletes still fail to realize the connection between the food they eat and their ability to compete in sports. The time for a reminder is now.

Proteins, fats and carbohydrates are the main components of your diet. Protein supplies amino acids for many processes in the body, but supplies little energy for exercise. Despite all the bad press, fat is a necessary ingredient. Fat insulates nerves, carries substances in the blood, packs organs and serves as a warehouse for energy, some of which is used to play soccer. Carbohydrate is the main source of quickly available energy in your diet. The amount of carbohydrate you eat will directly affect your ability to run and is the subject of this article.

Carbohydrate is found in many foods like vegetables, fruits, breads, grains, pasta, and dairy products. When eaten, carbohydrates are broken down into glucose and stored in your liver and muscles as a string of glucose molecules called glycogen. If your ability to run far and fast is related to how much gas you have in your tank (glycogen in your muscles), then the more you have stored, the farther and faster you can run. In addition, if you eat properly after heavy training, you can actually store more glycogen than if you ate improperly (see recovery part 3). So you could cover even more distance at a fast pace. Is fat used for energy in soccer? Yes, during low intensity work like walking and slow jogging. You won't run out of fat for fuel, but you can run out of glycogen. You need glycogen to go fast - remember, soccer is not played at a walk.

What is known about muscle glycogen and soccer?

Plenty...

1. Most soccer players make poor food choices (too much protein and fat) so they enter games with less than a full tank of gas (less muscle glycogen than most athletes should have). Trained athletes who monitor their diet have much more glycogen than a non-athlete. Most studies show the glycogen levels of the professional soccer player is little different from the spectators. Not good.
2. Most of the glycogen in the muscles is used in the first half of a game. By the end of the game, glycogen levels are almost zero. Your sprints get shorter and less frequent as the game goes on.
3. The more glycogen, the further and faster players run. A research study showed that players who ate lots of carbohydrate ran the most and only walked about 25% of the total distance. Players who ate a "normal" meal covered about 25% less distance and covered most of it at a walk. Can you guess who won this game?

Any suggestions for soccer players when choosing foods to eat?

Choose foods with the highest carbohydrate and lowest fat count. Carbohydrates should make up 55-65% of the diet. Choose, for example, bagels over sliced bread, baked potato over french fries, a high carbohydrate cereal over a low carbohydrate cereal (read those labels!).

A teenage or adult athlete should eat 450-600 grams of carbohydrate a day (spread it out over 24 hours-think you can eat that amount of spaghetti in one sitting? That's over 2 dry pounds of spaghetti!). Younger players would eat less because they are smaller. The rough formula is 7-10 grams/kg/day.

If you make poor food choices and train regularly, you can't refill your glycogen levels before tomorrow's practice. Thus, glycogen levels stair-step down as the week goes on. Ask any trainer of a team training daily - most injuries happen late in the week. Wonder why? It is important to eat plenty of carbohydrates during training, not just for matches.

Your muscles are the most "thirsty" for glycogen right after exercise. So try to eat a good supply of carbohydrates within the first 2 hours after play. Don't wait. Have carbohydrate rich foods available right after a game. This is especially important if you are

playing in a tournament with many games in a short time. Give yourself every advantage and refuel for the next games. Pack food and stay away from the drive through window. Pack fruit juices, carbohydrate replacement drinks (see recovery-part 3 for suggestions), bagels and jam, fresh or dried fruit, PB&J sandwiches, pasta salads, uncooked "Chex Mix". If candy is acceptable, choose "clear" candy like "gummi" candy, jelly beans, etc. (chocolate-based candy has too much fat and calories). Stay away from the chips, burgers, fries, nachos, etc.; too much fat and not enough carbohydrates.

The smart athletes will try to give themselves every advantage to help their team to win. Knowing you are going into a game with a "full tank of gas" means you are ready for the highest demands of the game. Also, if you have eaten properly and are playing a team who played yesterday (who likely hasn't eaten properly), you know you are at an advantage and will be fresher in the second half.

Questions can be directed to Hughie O'Malley, U.S. Soccer's Manager of Sports Medicine Administration. Hughie can be reached at [homalley@ussoccer.org](mailto:homalley@ussoccer.org) or at 312-528-1225.