

# HYDRATION

## Fluids - Drink Types

At a recent data collection session with Carolina United Soccer Club, we had the pleasure of chatting with a favorite political force of President Clinton: the soccer mom. There seemed to be some confusion about the different kinds of sports drinks on the market and what drink should be used and when should it be used.

There are basically two types of commercial sports drinks: an electrolyte replacement drink and a carbohydrate replacement drink. Each has their own unique properties that can benefit the soccer players. However, these drinks are not interchangeable. Electrolyte replacement drinks: These drinks are designed to replace the fluids (water) and electrolytes (sodium, potassium, chloride, etc) that are lost when exercising. Water is important because all our bodily processes depend on water. When we lose as little as 1-2% of our body weight as water, our ability to run distances and perform high power output activities gets worse. Water loss also impairs our ability to regulate our body temperature. The electrolytes in the drinks replace the salt lost through sweating. The salt in the drinks also helps the body retain the water ingested and makes it a little easier for the intestines to absorb the ingested fluids. There is a little sugar in the drinks to make them more palatable. Too much sugar (too many sugar molecules per unit of water - this will come up again) and the amount of water emptied from the stomach slows down – not good.

There are "prescriptions" for fluid intake before, during and after exercise that attempt to maintain water balance. Before exercise (the half-hour prior), one should weigh themselves, then drink up to 10-12 oz of fluids. Once exercise has started, about 6 oz should be ingested every 15-20 minutes. After exercise, weigh again and determine the amount of fluids lost (remember: 1 pound of weight lost = 1 pint of water lost) and drink back 1.5 times that amount. For example, lose four pounds (four pints of water), drink back six pints over the next six or so hours.

Carbohydrate replacement drinks: For high intensity exercise, muscles prefer to use muscle glycogen, the storage form of glucose. The purpose of these drinks is to supply a lot of carbohydrate in liquid form. The carbohydrate is a glucose polymer; a string of glucose molecules (the ingredient label should say malto-dextrin or maybe high fructose corn syrup).

Above, it was mentioned that too much sugar impairs emptying of the stomach. The important factor is the number of molecules, not the size of the molecule, so these drinks contain a lot of larger molecules. Once emptied by the stomach, the glucose gets into the blood fast, within five minutes in many cases. This elevates the blood sugar pool of energy and gives muscles another source of carbohydrate for exercise. These drinks are typically used in two settings. First, to give a source of energy during exercise.

Some teams drink this (6-12 oz depending on the size of the players) immediately prior to playing a game, then at halftime (not as a substitute for water or an electrolyte replacement drink). This helps delay fatigue seen in the 2nd half (players run farther at high speeds in the second half). Second, players will ingest these drinks right after a game (another 6-12 oz) to get a start on refilling their muscles with glucose (glycogen) for the next game. These drinks, which have a higher caloric content than electrolyte replacement drinks, are not meant to be fluid replacement drinks.

Many teams will have water as well as both types of drinks; water or electrolyte replacement drink before, during and after the game and the carbohydrate drink right before kick-off, at half-time and right after the game.

This sports science article comes from the Sports Medicine Section at the Duke University Medical Center and UNC Hospitals. The authors are members of the US Soccer Sports Medicine Committee including from UNC Dr. William E. Garrett, Jr (US National Teams Physician and Committee Chairman), and John Lohnes. From Duke are Dr. Don Kirkendall (exercise physiologist) and Patty Marchak (athletic trainer for 1996 US Women's Olympic Team).

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