

# “Fueling the Athlete”

Since the existence of human kind on planet earth, athletics, physical fitness, and especially hydration have been a huge part of everyone’s lives. We have always needed to stay fit and hydrated in order to work, compete, and survive. For thousands of years, human beings have used water as their primary source of fluid for hydration. However, in recent years scientists have developed new “sports drinks,” created for the sole purpose of hydrating athletes. The question is: Which is truly a better method of hydration, drinking water, which humanity has relied on for thousands of years, or drinking these new, synthetically created sports drinks?

## Hydration

Of all the activities required by humans to stay alive and well, hydration is one of the most important. It is required to stay healthy during athletics, replenish important materials in the body, and to keep the body

% body weight lost as sweat	Physiological Effect
2%	Impaired performance
4%	Capacity for muscular work declines
5%	Heat exhaustion
7%	Hallucinations
10%	Circulatory collapse and heat stroke

Figure 1: *Chart emphasizing the importance of hydration.*

alive and functioning. Hydration is defined as the condition of having adequate fluid in the body tissues, and this is achieved by drinking enough fluid, or “hydrating.” Not only is hydration essential to survival, but it is also a key

component during athletic activity. It replenishes vital fluid for perspiration, it keeps you level headed during this loss of materials, and it keeps all your muscles functioning properly.

## History

Hydration and fluids have always affected everyone’s lives. Also during this time, water was the single or one of few sources of hydration, and the importance of water and hydration were practically interchangeable. Water has been the staple fluid for hydration for thousands of years. It is required to keep the body functioning, and has proven itself over time as an adequate hydrating fluid. On the other hand, sports drinks are much more recent and less trustworthy. Originally developed in 1965, Gatorade was the first sports drink to be created. According to Darren Rovell, Gatorade was developed by Dr. Robert Cade

and a team of scientists at the University of Florida, hence the name. They originally created this substance while trying to create a fluid to alleviate dehydration and cramps that their football players experienced.

### **Health Factor**

Deciding which type of fluid to hydrate with is important for athletes of all sports. One factor that should influence your decision is how healthy the fluid is for your body. Water, the most commonly used fluid for hydrating purposes, has no real negative influences on your body. But, on the downside, water also has little or few supplements in it, so it is neither very healthy nor very unhealthy for your body. Sports drinks, on the other hand, have some good and some bad influences on the body. One positive thing about them is that they are enhanced with all different types of vitamins and minerals. Some of these include carbohydrates, glucose, and proteins. However, not everything in these sports drinks is good for you. They are highly acidic substances, and will harm the protective coating on your teeth if they come into contact for too long.

### **Composition**

Another important step in deciding which fluid to use when hydrating is learning about the drinks and their composition. Water is pretty self explanatory, as it is simply H<sub>2</sub>O, which makes up the majority of the human body. It may contain a few additional supplements, but not enough to drastically affect your decision. Sports drinks are a completely different story. They are synthetically created to contain as many helpful vitamins, minerals, and other things of the sort to benefit the body the most. Some of these include electrolytes, carbohydrates, and glucose. Electrolytes are chemical compounds that help maintain the acid / base relationship required to keep cells functioning normally. They also contain important minerals including sodium, potassium, calcium, magnesium, chloride, phosphate, and sulphate. (McGuigan, Brendan. "What is an Electrolyte?" [WiseGeek.com](http://www.wisegeek.com/what-is-an-electrolyte.htm). 5 Dec. 2007 <<http://www.wisegeek.com/what-is-an-electrolyte.htm>>.)

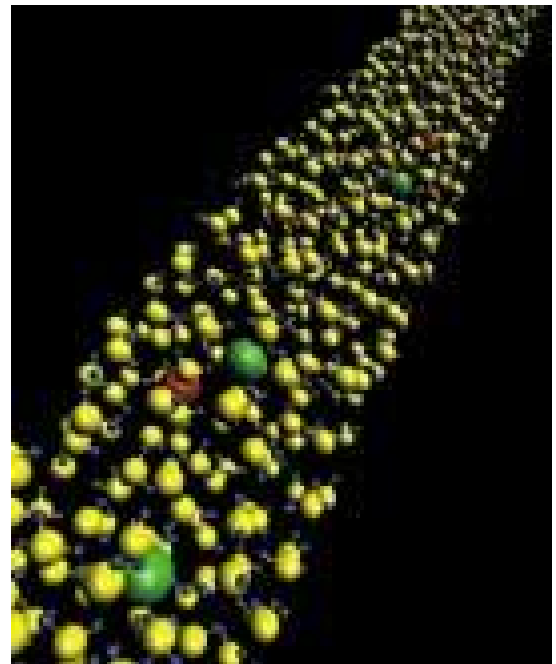


Figure 2:  
*Graphed image of a chain of electrolytes.*

## Positive Effects

### Water

Both of these fluids when used for hydrating have different effects on the body. Most of these are positive effects, and are beneficial to the body during athletic performance. Water, the most common source of fluid hydration, has several positive effects on your body. One such effect is that it quickens your

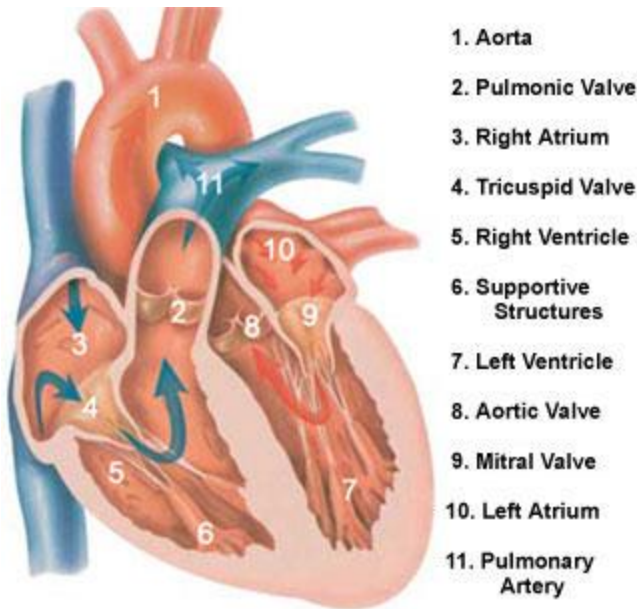


Figure 3: Image of the human heart showing all the routes blood has to travel to be circulated throughout the body.

blood circulation. This helps your heart rate and circulatory system functioning well, and lets the blood flow quickly and easily to the places it needs to get.

Another positive effect that water has on the human body is that it produces sweat. Sweat, also known as perspiration, is the body's natural defense against over heating. It is produced by numerous tiny glands all over the body, and it coats the body to lower your body temperature.

Sweat is mostly salt and water and drinking more water helps to produce more sweat, and therefore allows the body to cool itself. Water is

also beneficial in the way that it clears out your systems to make bodily activities faster and more efficient. Some of these systems include the circulatory system, the digestive system, even the respiratory system and several more. (Vodopich, 1) With all of these systems of your body operating more efficiently, your body will function well and therefore make you an all around better athlete.

### Sports Drinks

Sports drinks, the more recent and other commonly used fluid for hydration, also have many positive effects on your body. One of these is that they contain electrolytes. As previously stated, electrolytes are chemical compounds that contain many necessary vitamins and minerals and also help maintain the acid / base relationship in the body. These electrolytes give you a boost in all your body's capabilities, and are

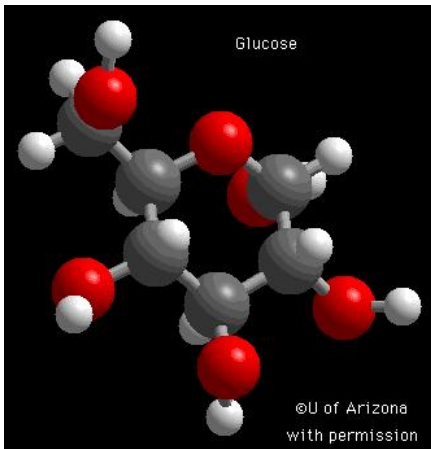


Figure 4: *Graphed image of glucose, found in its liquid state.*

very helpful for keeping you functioning properly during athletic activity. Sports drinks are also helpful in the way that they are very efficient combatants of dehydration. Due to the fact that they have been synthetically created by scientists, they contain many ingredients that help to keep the body hydrated. Along with many important vitamins, minerals, and other things of the sort, sports drinks supply the body with glucose. Glucose, commonly thought of as sugar, is the source of energy preferred by the body. By supplying the body with a good amount of glucose, sports drinks help keep energy levels high and athletic capability to a maximum.

### **Negative Effects**

#### **Water**

Along with all of these positive effects, both drinks unfortunately do have some negative ones on your body. Water, for example, causes bloating in the body. If too much water is ingested, it causes your glands and organs to bloat somewhat which can severely limit your physical activity. Another negative effect of water is that it suppresses thirst. You may think this is a positive bonus, but it can turn out to be a negative one. When you drink water it makes you less thirsty and makes you not want to or feel like you do not have to drink anymore. Therefore, water is a poor choice for hydration when high fluid intake is required. Another downside of using water as a source of hydration is that while it is adequate for hydrating purposes, it contains little or no beneficial ingredients. Water will keep the body functioning fine, however, unlike sports drinks, it will not enhance your physical performance in any way.

#### **Sports Drinks**

Sports drinks, although created with the intention of helping athletes in many ways, have several negative effects on the human body. One negative effect of these sports drinks is that they are highly acidic. As they pass through your mouth, wash over your teeth, and continue into your digestive system, they are corroding things all the way and throwing off the delicate acid / base relationship of the body. Of the many parts of the body that this affects, the most dramatic effect is on the teeth. The acidic nature of these drinks eats through the protective coating on the teeth, called enamel, and is known to cause many a

cavity in their user's teeth. Another downside to drinking these sports drinks is that they contain additives.

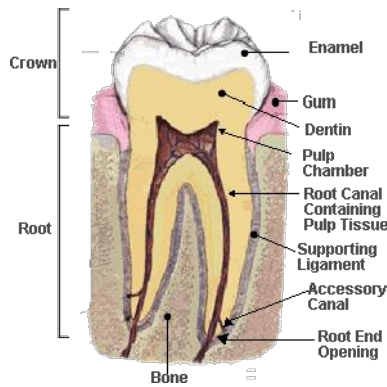


Figure 5: *Image of tooth showing protective layer of enamel sports drinks corrode.*

Additives, according to the U.S. Food and Drug Administration, are any substance of mixture of substances other than the basic foodstuff which is present in food as a result of any phase of production, packaging, processing, or storage (1). These additives are a result of the methods of creation of sports drinks, and they have been known to be potentially toxic. Although a sports coach would be pleased if an athlete drank these sports drinks, the athlete's dentist and doctor would most likely not be.

### **Conclusion**

As you can see, both of these fluids are excellent sources of hydration for athletes. Water, the more commonly used fluid that has been used for thousands of years, and sports, the modern, synthetically created fluids with the purpose of hydrating athletes. The question all of the athletes are asking is: "Which is the better choice to be used during athletic activity?" The problem with this is, there are many people with this question, yet seldom few with answers. Even then, no one's answer can be absolutely proven to be right for everyone. So many factors, some examples include sweat rates and hydration levels of certain individuals, and the altitude, temperature, duration, and intensity of the athletic activity, cause the answer for each person to vary. Therefore, with only information and no straight answer available, it is suggested that athletes try both water and sports drinks for hydrating during athletic activity, compare the results, and choose the drink that best fits their own personal hydration needs.

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## **Images**

### Figure 1

Hydration Levels and the body's reaction. Chart. Clare Woods, 2007. Sports Nutrition. Ed. Clare Wood. 8 Oct. 2007. 7 Dec. 2007 <<http://www.topendsports.com/nutrition/hydration-fluids.htm>>.

### Figure 2

Peters, William. "Graphed Chain Of Electrolytes." Cartoon. Thirst Quencher. 23 June 2004. 7 Dec. 2007 <<http://www.karinya.com/sportsdrinks.htm>>.

### Figure 3

"The Human Heart." Cartoon. Sports Drinks. 11 Oct. 2007. 7 Dec. 2007 <[http://www.vanderbilt.edu/AnS/psychology/health\\_psychology/gatorade.htm](http://www.vanderbilt.edu/AnS/psychology/health_psychology/gatorade.htm)>.

### Figure 4

"Glucose." Cartoon. Water Vs. Sports Drinks. 31 Aug. 2005. 7 Dec. 2007 <<http://www.drmirkin.com/fitness/8697.html>>.

### Figure 5

"The Tooth." Cartoon. What You Need to Know About Hydration. July 1999. 7 Dec. 2007 <<http://www.americansportsevents.com/pages/ResourceContent/>>.