

How Calculating Sweat Loss Can Boost Your Performance

- *By Jeff Gaudette | For Active.com*

Scan your neighborhood magazine rack or your favorite running website sometime in May, and you'll be bombarded with articles on the importance of hydrating in the summer—like you didn't already know that—and the dangers of dehydration.

However, read these same magazines and websites in June, and then they're discussing the dangers of drinking too much (scientifically called hyponatremia) and how over-hydrating can be deadly. What once seemed a pretty simple strategy to beat the heat gets a lot more confusing.

Luckily, with a little planning, a helpful calculator—and a better understanding of hydration in general—you can easily calculate exactly how much fluid you need for optimal performance in any temperature - without being in danger of over-hydrating.

What is Hyponatremia?

Simply stated, hyponatremia is caused by a disturbance in the balance of electrolytes in your body, more specifically sodium, which is typically the result of drinking too much water.

When the sodium level in the body's cells gets too low, water moves into the cell in an attempt to balance fluid levels. This causes the cells to swell, which isn't a problem for most cells in your body—except for those in the brain.

Brain cells can't expand when the cells swell because of how tightly they are confined within the skull. Consequently, the brain begins to swell itself, which induces symptoms such as headache, nausea, cramps, confusion, and fatigue. In addition to being dangerous, these symptoms are also common signs of dehydration, which make diagnosing the problem difficult.

To prevent hyponatremia, it's important that runners drink only enough water to replace what they've sweated out and balance this water intake with electrolytes to maintain metabolic stability.

Why Sports Drinks May Not Be Your Friend

Electrolytes are electrically-charged ions your cells use to carry electrical impulses (such as the nerve impulses and muscle contractions critical to running) across themselves and to other cells. Electrolytes are necessary for your digestive, cardiac, muscular, and nervous systems to function well.

Electrolytes are commonly found in sports drinks, such as Gatorade? and PowerAde?. However, what many runners don't realize is that the speed of absorption of fluids into the body is largely dependent upon the composition of the fluid in terms of its carbohydrate (sugar), sodium (salt), and potassium concentrations.

As a general rule, the higher the carbohydrate content, the slower the absorption rate. Therefore, trying to maintain proper hydration and balanced electrolyte levels with sugary sports drinks is difficult. Because of the high sugar content of most sports drinks, the fluid is not readily absorbed into the blood stream.

Furthermore, the body monitors electrolyte losses during running through hormones. After a run, if electrolytes are consumed in high amounts, it neutralizes the hormonal system and disrupts the body's regulation processes. Therefore, chugging down a sports drink or electrolyte tablet after a run isn't going to lead to optimal performance during the next run and increases health risks related to electrolyte imbalances after.

Calculating Sweat Loss for Optimal Hydration

As you can see, maintaining proper hydration levels and electrolyte balance is critical for optimal performance and safety when running in the summer heat. The most efficient way to rehydrate properly is to put back exactly how much fluid you've lost while running. The Internet is filled with general advice on how much you need to drink in order to accomplish this goal: drink to thirst, which doesn't keep up with the body's sweat loss rate; or drink 8-10oz per hour, which doesn't factor in temperature or individual sweat rates.

Unfortunately, there are two major issues with generalized advice when it comes to hydration. First, different temperatures and humidity levels will drastically influence your sweat-loss rate. Second, every runner has their own unique sweat rate and will be impacted by weather in a different way.

Humidity has a major impact on sweat rates (as I am sure you've noticed if you've done any running in muggy weather) because sweat can't evaporate to cool the skin off, which raises internal body temperature and produces more sweat. Therefore, it's critical that you factor humidity levels into your hydration strategy and not rely on general advice.

How to Calculate (Your Own) Sweat Rate

Likewise, runners can have drastically different sweat rates—some runners can sweat twice as much as a similarly-conditioned runner. So, applying generalized advice might be too much water for you, but far under what your training partner may need.

This sounds like a terrible predicament, but calculating your exact fluid loss in any given temperature and humidity is actually quite easy if you use this [sweat-loss calculator](#). All you need to input is your weight before each run, your weight after each run, any fluid taken in during your run, and the distance/time you run. The calculator will do the hard work for you.

By recording the temperature and humidity for that particular run, you'll now have the exact sweat-loss rate in those conditions. Do this a few times in different temperatures, and you'll have an easy reference chart of exactly how much fluid you need to take in on any given run in any given temperature.

Not only is this useful in training to keep you safe and balanced, but it's also an amazing tool when you're racing. You'll know exactly how much fluid you'll need to take at each water stop or how much you'll need to carry with you. You can eliminate sloshing stomach issues or wasted time at water stops.

By taking the time to make a chart and approaching your hydration strategy in a methodical, scientific manner, you can easily beat the heat this summer and remove all fears related to dehydration and hyponatremia.

Jeff Gaudette is a 2:22 marathoner and owner of [RunnersConnect](#), a team of expert coaches dedicated to helping you run faster with the latest running and nutrition research as well as training insights from elite runners. He recently released a free eBook, *16 Weeks to a Faster Marathon*.