

Sports Nutrition

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The Athlete's Kitchen

Sweat contains more than just water; it has electrically charged particles (electrolytes, commonly called minerals such as sodium) that help keep water in the right balance inside and outside of cells. You've likely seen ads for electrolyte supplements that highlight sodium.

Sodium gets lost with sweat, so it makes sense sweaty athletes should replace those losses, right? What are the sodium guidelines? How much sodium does an athlete actually need before, during and after exercise? What are the best strategies to maintain optimal sodium and fluid balance? Do athletes really need commercial electrolyte products? Can you take the info in those advertisements with a grain of salt?

To address these questions, I defer to respected sport nutrition researcher Alan McCubbin PhD of Monash Univ. in Australia. In his recent article *Sodium intake for athletes before, during and after exercise: review and recommendations*, McCubbin states: "Currently there is no evidence that athletes require a greater dietary sodium intake day-to-day, due to regulation of sodium losses via the kidneys and sweat glands. Whether before, during or after exercise, evidence suggests that it is the relationship between sodium and water that influences health and performance outcomes ... Sodium intake strategies will be most effective when thought of as part of, and not independent from, hydration strategies."

Daily sodium intake: The more we exercise, the more food we eat and the more sodium we consume. Most of us ingest far more than the recommended limit of 2,400 mg/day that can help manage blood pressure in the one-third of healthy people whose blood pressure rises when they eat salty foods. This excludes many athletes.

- The food we eat is an abundant source of electrolytes. For example, a recovery drink of chocolate milk offers more sodium than Gatorade (135 vs. 110 mg/8 oz).

- The human body typically contains ~450 mg. sodium per pound (1,000mg/kg) body weight. For a 150-pound athlete (69 kg), that comes to 67,500 mg sodium in the body, mostly in fluids that surround the outside of cells.

Should athletes consume sodium before they exercise?

- Even without electrolytes, plain water is hydrating. With electrolytes, we retain water better, i.e., it doesn't just go in one end and quickly out the other.

- Consuming pre-exercise sodium can increase thirst and a desire to drink, which can optimize hydration.

- Some athletes believe they should *sodium-load* for three to four days before a marathon or other endurance event. Doing so is unhelpful; it may not reduce exercise-associated muscle cramps or low blood sodium (hyponatremia) during the event. Our kidneys do a fine job of maintaining a stable sodium level in the body.

Consuming extra sodium within just 4 hours of exercise can increase total body sodium for hyperhydrating. That said, consuming a lot of extra sodium and extra fluid might contribute to intestinal issues. Current research suggests this pre-exercise hyperhydration tactic may not improve weight-bearing exercise in hot weather.

Sodium: How Much Does an Athlete Really Need?

Should athletes who must "make weight" cut back on sodium to induce water loss (diuresis) to weigh less?

Three days of a low sodium diet contributes to about 1.3 pounds (0.6 kg) of weight loss. This may not be helpful if the athlete ends up underhydrated starting the event.

Should athletes consume sodium during exercise?

- Athletes lose proportionately more water than sodium in sweat. In under-hydrated athletes (who replace less than 70% of water losses during sweaty ultra-exercise), the amount of sodium in their blood can actually increase even if the athlete does not consume any sodium.

- Concerns about low blood sodium arise when an endurance athlete over-hydrates with plain water. This dilutes the reduced amount of sodium in the body. Drinking excessive plain water without any added sodium or food that contains sodium is what leads to hyponatremia.

- The amount of sodium consumed during exercise has little impact on enhancing the absorption of fluids (or glucose) from the intestinal tract.

- Sodium losses during exercise also do not seem to be consistently connected with muscle cramping. Many factors create exercise-induced cramping.

- Sodium consumption during exercise has not been linked to better performance (apart from one weak study)—that is, unless the consumption of extra sodium leads to greater thirst and thereby greater fluid consumption and reduced risk of becoming dehydrated.

- Attempting to replace 100% of sodium losses (as ads for electrolyte replacers might suggest) could result in *hypernatremia* (elevated sodium) in under-hydrated athletes.

- Sweat-composition testing may help ultra-endurance athletes determine their personal sodium losses. But this testing, in general, is needless and comes without benefit for those who underhydrate. Blood sodium levels will rise regardless of sodium losses.

How much sodium should athletes consume postexercise?

- Consuming post-exercise sodium stimulates the drive to drink as well as helps retain recovery fluids. That said, an athlete who is underhydrated likely already has elevated serum sodium which nudges a drive to drink.

- The kidneys conserve sodium when the amount of sodium in the blood drops, hence that reduces the need for consuming extra sodium (unless you drink lots of water).

- To optimize fluid retention, enjoy salty recovery snacks (pretzels, salted chips) or a meal (soup, pizza).

- *Listen to your body.* Anecdotally, many athletes swear they feel better when they consume more electrolytes such as sodium. Extra post-exercise salt (sodium) is unlikely harmful (unless it elevates your blood pressure). If you're craving salt, skip the electrolyte supplements and simply sprinkle salt on your recovery food. Yum!

Nancy Clark MS RD CSSD counsels both fitness exercisers and competitive athletes in the Boston-area (617-795-1875). Her best-selling *Sports Nutrition Guidebook* is a popular resource. Visit NancyClarkRD.com for more information.