

Muscle Cramps: The Right Ways for the Dog Days

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August brings the grueling combination of training camps and intense heat. As athletes make their way back to school and get back into shape, dehydration and muscle cramping sometimes occur.

No laughing matter, whole-body muscle cramps are debilitating and can sideline an athlete for the day, at least. What's the game plan to defeat cramping?

What Causes Cramping

First, understand what causes cramping. Muscle fatigue, salt loss and dehydration – all three acting together – play a role in muscle cramping. Consider this: on a hot day a 250 lb-football player can easily lose as much as one gallon of sweat in the course of a game. In losing that much sweat, the player can also lose enough sodium chloride to equal 2 to 3 teaspoons of table salt. Compared to the trivial losses of potassium, calcium, and magnesium in sweat, the loss of sodium can be huge.

The Loss of Sodium

Why worry about losing sodium? Sodium is key not only to maintain blood volume but also to help nerves fire and muscles work. Sodium depletion short-circuits the coordination of nerves and muscles as muscles contract and relax. The result can be muscle cramping. Players most prone to disabling whole-body cramps are those most lean and fit, intense and explosive at their position, who take many reps in the heat, sweat early and heavily, and cake with salt.

So the first line of defense against cramping is to encourage your athletes to consume more salt and drink enough of the right fluids.

A Balanced Diet

Set the tone for the team by advocating a balanced diet and recommending the best beverages for athletes before, during and even after the dog days of summer. Popular foods rich in sodium include tomato juice, canned baked beans, dill pickles, pretzels, canned soups and cheese pizza.

Hydration Options

Options for hydration include various sports drinks and bottled waters, all claiming to help athletes reach peak performance. In hot and sweaty weather, it is vital that athletes choose the right fluids to stay hydrated and maintain a healthy balance of electrolytes – most importantly sodium – to help prevent muscle cramping. Sports drinks taste good, which encourages players to keep drinking, and contain sodium (Gatorade thirst quencher has 110 mg in 8 oz) to help fend off muscle cramping. Water, which contains almost no sodium, is not the best choice as your only drink in hot, humid playing conditions.

Myths on Preventing Muscle Cramping

And then there are the myths. Some coaches have used super-salty sources like pickle juice, mustard and even antacids as quick, on-field “fixes” for sodium-related muscle cramping. There is no scientific evidence to support these remedies and, in most cases, they provide too much salt and not enough fluid.

For most players, a balanced diet containing some salty foods and proper hydration with a sports drink will suffice to stave off cramping. For those who are prone to severe muscle cramps or who are “salty sweaters” – that may not be enough. Players with extreme cramps need even more sodium which they can get by adding 1/4 teaspoon of salt to a 16 to 20 oz beverage.

Preventing heat cramps is all about what players put in their body. Keep them well hydrated and replace sodium and other electrolytes and you'll keep them in the game.



Curbing Muscle Cramps: More than Oranges and Bananas

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Everyone has seen heat cramps - the painful muscular spasms that can take an athlete out of the game. Common in football "two-a-days," heat cramps can also strike in long, hot tennis matches, 100-mile cycling races, and late in tropical triathlons. A common denominator here seems to be "salty sweating." Yet the causes and mechanisms of heat cramps continue to perplex.

Not all cramps are alike. Writer's cramp, fiddler's cramp, and golfer's yips are not from salty sweating. Nor is salty sweating key in exertional cramping of the torn hamstring of a hurdler or the legs of sickle-trait athletes. And nocturnal calf cramps are not from salty sweating. But three lines of evidence implicate salty sweating - along with muscle fatigue - as the root cause of whole-body heat cramping.

The first line of evidence is 100 years of history. Every generation, it seems, rediscovers the role of salt depletion in heat cramping. In the early 1900s, stokers on ocean liners fought cramping with seawater in their drinking water. British coal miners added salt to beer and water. Their salty water was "about the composition of sweat." Salty milk cut cramps in men building the Hoover Dam. And the U.S. military gave a saline drink to WWII soldiers in desert heat.

The second line of evidence comes from research in athletes. We and others observed clinically that crampers in football and tennis seemed to be "early, heavy and salty sweaters." Researchers at GSSI and elsewhere gauged sweat rate and sweat sodium in individuals - runners, cyclists, tennis players, football players, and other athletes - and found that crampers tend to have high sweat rates and/or high sweat sodium concentrations. Working with GSSI researchers, in what may be the first on-field metabolic study in Division 1 football, we studied fluid balance, sweat rates, and sweat sodium and potassium levels during summer workouts and two-a-days in five known heat-crampers versus five matched non-crampers. We showed that crampers lose more sweat sodium and dehydrate more than non-crampers. It seems likely that the three-fold cause of whole-body muscle cramping is salt depletion, dehydration, and muscle fatigue.



Curbing Muscle Cramps: More than Oranges and Bananas (continued)

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The third line of evidence is therapeutic success. We find "the solution is saline." In general, football heat-crampers tend to be lean and fit, intense and explosive, able to stay in action for hours, heavy sweaters, and "salt-cakers." Paradoxically, some of them eat low-salt diets. We urge them to salt their food and eat salt-rich foods. We put pretzels in team meetings. Onfield for crampers, we rotate Gatorade with GatorLytes (about 3- or 4-to-1), with water only as a "chaser." If players do "lock up," we reverse it with the above sports drinks or in the face of vomiting, with intravenous normal saline. Even widespread, severe cramping usually subsides after 2-3 hours and 2-3 L of normal saline. In conclusion, to prevent heat cramping in athletes, forget potassium, calcium, magnesium, and phosphate. The prevention - and the cure - of heat cramping is salt and fluids. The solution is saline.