ELECTROLYTE REPLENISHMENT

I've made some big mistakes over the years in vain attempts to resolve heat and electrolyte related problems, from indiscriminately tossing down sodium tablets to guzzling almost every sports drink ever created. For my all-time greatest disaster, I'd choose the 1995 Race Across America. I was in peak physical condition, but I was not prepared for the extreme heat I encountered during the first day through the Mojave Desert. I dehydrated, became electrolyte depleted and ended up in the hospital where they reconstituted me with eight liters of IV fluid! My race across America never made it across California. Just a few hours of inadequate electrolyte and water intake wiped out months of training. You may never bike through the Mojave in summer, but you will encounter debilitating heat and humidity at some point in your training or competition. However, it doesn't take severe weather stress to prove that electrolytes are as vital to performance as your energy supply. Even when it's cold outside, and I have a chorus of Nordic skiers to sing "amen" here, you need electrolyte replenishment. Sure, hot weather increases cramping potential, but cramping prevention isn't the primary reason for electrolyte supplementation. No one wants to cramp, of course, but cramping is a place far down the road of electrolyte depletion.

Cramping is your body's painful way of saying "Hey! I'm on empty! Re-supply me now or I'm going to stop." Just as you don't wait until you bonk before you re-fuel, you don't wait for cramps to remind you to take electrolytes. Electrolytes are analogous to the motor oil in your car-it doesn't make the engine run, but it's absolutely necessary to keep everything running smoothly. Proper functioning of the muscular, digestive, nervous, and cardiac systems depend on adequate electrolyte levels. Cramping is like the oil light on the dash; you never want to get that low. And when you've got smoke coming from the engine, as I did in the '95 RAAM, your race is over and your day is done. In this article, we'll look closely at this vital, but oft neglected and misunderstood aspect of fueling. I'll tell you why salt tablets don't work, and why Endurolytes is unquestionably the finest electrolyte formula you can use.

In addition to replenishing calories and fluids, proper fueling during exercise requires consistent and adequate electrolyte support as well. Electrolyte needs vary much more than either caloric or hydration needs, so you may need to need experiment quite a

bit in training until you have this aspect of your fueling tailored to your specific requirements under various conditions. What Are Electrolytes And Why Do I Need Them? Electrolytes are chemicals that form electrically charged particles (ions) in body fluids. These ions carry the electrical energy necessary for many functions, including nerve impulse transmission and muscle contractions. Many normal bodily functions depend on these substances; optimal performance requires a consistent and adequate supply of these important nutrients. Many athletes neglect consistent electrolyte replenishment because they've "never had cramping problems." Even if you've been fortunate enough to have never suffered the painful, debilitating effects of cramping, you still need to provide your body with a consistent and adequate supply of electrolytes.

Replenishing electrolytes is not so much to prevent cramping but to maintain specific bodily functions at optimal levels. Cramping is your body's way of letting you know that regarding electrolytes, it's "on empty." When you've reached that point, your performance has been severely compromised for some time. Remember, you want your body to perform smoothly, without interruption or compromise, so just as
you don't wait until you're dehydrated or bonking before you replenish fluids or calories, you never want to wait until you're cramping before replenishing electrolytes. As important as the fuel you consume and the water you drink during exercise is a consistent replenishment of electrolytes.

Salt tablets are an unacceptable choice for electrolyte replenishment for two reasons:

1.) They provide only two of the electrolytes your body requires-sodium and chloride.
2.) They can oversupply sodium, overwhelming the body's complex sodium level regulation mechanism

Each of these issues is important, and we'll discuss both of them. Right now, let's focus primarily on the second one. Far too many athletes have suffered needlessly with swollen hands and feet from water retention due to ingestion of salt tablets or electrolyte products too high in sodium during prolonged exercise in the heat. The body has very effective mechanisms to regulate and recirculate sodium from body stores. Excess sodium consumption interferes with or neutralizes these complex mechanisms. Sweat

generates large sodium loss, which is monitored closely through hormonal receptors throughout the body. However, rapid sodium replacement neutralizes the system, allowing water intake to dilute sodium content. High sodium electrolyte supplementation contravenes natural physiological serum electrolyte control. Once the body detects an increase in sodium from exogenous sources (i.e., food, salt tablets, or products too high in sodium), the hormone aldosterone signals the kidneys to stop filtering and re-circulating sodium and instead excrete it. When this happens, another hormone, vasopressin, predominates and causes fluid retention. If you've ever finished a workout or race with swollen hands, wrists, feet, or ankles, or if you have experienced puffiness under your eyes and around your cheeks, chances are your sodium/salt intake was too high. The truth is that the human body needs only a minute amount of sodium to function normally.

We require a mere 250 mg of sodium each day, athletes maybe 500 mg, which is easily supplied by natural, unprocessed foods. However, the average American consumes approximately 6000 to 7000 mg per day. The average athlete stores at least 8000 mg of dietary sodium in tissues and has these stores available during exercise. In other words, you already have a vast reservoir of sodium available in your body from your diet, ready to serve you during exercise. In addition, your body has a highly complex and efficient way of monitoring and re-circulating sodium back into the blood, which it does to maintain homeostasis. Yes, you do need to replenish sodium during exercise, but it has to be in amounts that cooperate with and not override these complex body mechanisms. The way to fulfill sodium requirements is not by indiscriminate consumption of salty foods or salt tablets, but rather with a lower-sodiumn approach that emphasizes a balance of essential minerals that cooperatively enhance the body's natural hormone and enzyme actions.

You want a product that contains a moderate supply of sodium, one that will provide necessary electrolyte support without compromising internal regulation. It's easy to formulate a product that matches one of the many perspiration analysis studies and then sell it on the basis that athletes simply need to replace what they lose. Some products do just that. Unfortunately, there's a problem with this because individual sweatloss differences vary greatly and the human body does not and cannot efficiently replace what it expends during exercise at any intensity above a walking pace. Electrolytes lost are not

replaced by electrolytes consumed. The body replaces only 35-45% of what it loses during exercise and this is true for fluids, calories, and electrolytes. If you try to replace all the fluids at once, you may end up mwith dilutional hyponatremia (overly diluted blood sodium levels) or water-intoxication. If you attempt to replace all the fuel you expend, your stomach will back up in total rebellion, and refueling will grind to a halt. And if you try to replace, in equal amounts,