

ENDURANCE NEWS



The Newsletter For Endurance Athletes
An E-CAPS / Hammer Nutrition Publication

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Stay Cool : Hot weather adaptation

Bill Misner, Ph.D.

In extremely hot climates or due to an internal infection, core body temperatures can rise to dangerous levels. Hyperthermia, a life-threatening disorder, typically starts in humans when body temperatures rise to 105-107° F. (40.6-41.7° C.). Athletes lose heat to the surrounding environment by 4 pathways [1, 2]:

1. Radiation of Heat Waves - 60%
2. Evaporation of Sweat - 22%
3. Convection of Air Currents - 15%
4. Conduction to Objects - 3%

There are LIMITS to how much heat the body can withstand during exercise. But there are ways by which adaptation to heat stress may be improved.

Simple radiation is responsible for most of the loss during normal temper-

ature range, but in hot dry climates evaporative cooling and sweating is more significant. Adapting to hot environments is complex. The effect of heat on human bodies varies with the relative humidity of the air. HIGH TEMPERATURES + HIGH HUMIDITY makes it very difficult to lose excess body heat. This is due to the fact that when the moisture content of air goes up, it becomes increasingly more difficult for sweat to evaporate. The sweat stays on our skin and we feel clammy. As a result, we do not get the cooling effect of rapid evaporation.

In DRY HOT weather, humidity is low and sweat evaporates readily. The higher the desert temperatures, the more significant of a cooling effect we

(see HOT WEATHER on page 3)

Low Sodium/High Sodium : Where we stand

Steve Born

It's looking like we're in the minority on this one. What I'm referring to is the seemingly growing number of "experts" who are recommending that you increase your sodium intake - either on a daily basis, in the week leading up to an event, during an event, or all three combined - to prevent heat-related problems. Also on the rise are the numbers of companies that seem to be on a sodium "kick," meaning that their product is loaded with high amounts of this mineral, the amounts seemingly getting higher and higher. It's as though sodium-or more appropriately put, more and more sodium-is the key to resolving all your heat related problems! If that's the consensus of so-called experts and other nutritional companies then yes, we're definitely in the minority on this issue.

Look, there's no doubt that sodium is an important mineral for maintaining optimal exercise performance and it's important to note that during exercise you excrete sodium faster than any other electrolyte. In addition, if sodium gets too diluted (usually from overhydration), hyponatremia, a medical emergency, may result. However, and this is the key, the kidneys have specific (and complex) mechanisms to regulate sodium excretion. When sodium concentration gets too low, you secrete hormones that help retain the remaining sodium and keep it circulating within the system. Your body knows how to regulate itself!

Before you buy into the high sodium rationale, consider this: Excess sodium

(see SODIUM on page 5)



Welcome,

The first thing I want to do is thank you for your support - To those of you who have been with us since the early days and those of you who have discovered us more recently. Without your support, I would not be 19+ years into this adventure and we would not be able to offer the products and information that we do. There are more products than ever on the market today, and that makes your support so much more valuable and appreciated. So, thank you for allowing my staff and me to continue this good work.

Continuing to inform you and keep you up to date on the latest in nutrition and fueling is a lot of work. That is why I'm so pleased that we have located and hired a new staff nutritionist, James Stevens, M.S., R.D. James will receive his Ph.D. before the end of the year, so we'll have a new doctor to assist mightily in our ongoing efforts to keep you informed and provide a counterbalance to the hype and fluff. He will make his grand entrance in issue #52, but will soon be active on the Endurance list and field the more complex questions we get from clients daily.

In case we have not stated it obviously or frequently enough, here is our platform, which you can expect us to consistently speak from in this publication and elsewhere:

Daily Diet - Eat whole (organic) foods as much as possible. Avoid packaged, processed foods and junk foods at all times. Do not consume any artificial sweeteners, colors, or flavors, and avoid preservatives as much as possible. The quality of the calories you consume ALWAYS matters.

Sugar Bad - Avoid all "ose" (sucrose, fructose, glucose, etc.) highly processed sugars in your daily diet and especially during exercise. These sugars are not

only inefficient fuels, they're health hazards as well.

Protein - It's not just for strength athletes; it's vitally important for endurance athletes as well. Consume 1/2 gram of protein per pound of bodyweight daily as a minimum. Increase to 3/4 gram/pound of bodyweight daily during periods of high volume endurance training and/or when wanting to increase lean muscle mass. When your exercise extends well beyond two hours, soy protein should be included in your fuel.

The "balanced diet" myth/the necessity of prudent supplementation - How many of you take no supplements because you believe you eat a "balanced diet?" Did you know that there has never been a single clinical study that documents what comprises a balanced diet, nor one that has demonstrated one's ability to meet basic nutrient requirements through whole foods alone? That's because it is not possible. Thus, our position that prudent supplementation is essential for optimum performance and health.

Fueling during exercise - Replace what you can effectively assimilate, not what you lose, with limited, measured fluids, complex carbs, moderate sodium and other electrolytes, and soy protein when exercising beyond two hours. Also avoid products that contain "ose" highly processed sugars, artificial sweeteners, colors or flavors.

It looks like high sodium intake, both in the daily diet and while exercising, is going to have to be added to our educational efforts and to the above "platform." This is rather odd to me, since it seemed like everyone, (holistic and allopathic communities) have agreed for the past 20 years, or more, that high sodium intake is bad for your health. Unfortunately, many "experts" have decided that high sodium intake is good for you if you are an endurance athlete and exercise in the heat.

Show me an athlete with salt crust on their skin and clothing and I'll show you an athlete that consumes a high sodium diet. The more you eat, the more you will excrete; it really is that simple.

However, some companies are now touting the high sodium content in their gels and sports drinks as a key feature. We even have clients asking us why we don't put more sodium in our products.

High sodium intake is not only contrary to optimal health but it contravenes normal body mechanisms that regulate sodium excretion and recirculation during exercise. This is why we have always advocated a low sodium diet and moderate sodium intake during exercise. Many articles in previous issues of Endurance News, as well as those on our website, have clearly and convincingly made the case for a low sodium diet. I encourage you to read those as well as Steve's most recent article in this issue. That way, the next time someone tells you that more sodium is better, you'll know otherwise.

Enjoy the read, live long, and hammer!
Brian

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Our Mission

The objective of Endurance News is to provide you, the serious endurance athlete, with a valuable resource that you will find to be informative, educational, thought provoking and helpful in your ongoing pursuit of optimum performance and health.

Endurance News features insightful articles on diet, nutrition, training and other topics of interest for endurance athletes — written by myself as well as professional and elite amateur athletes and other experts in the area of nutrition and exercise. In addition, Endurance News will include articles highlighting new and existing E-Caps products and how to get the maximum benefits from them.

In reading this and future issues, please remember that the views expressed in this publication will always be biased in favor of a healthy diet, hard training that emphasizes quality over quantity, and prudent supplementation to improve health and performance. But above all, we at Endurance News believe there are no short cuts, and success can only come from hard work.

Back issues of Endurance News are available online at:
www.hammernut.com

Legal disclaimer: The contents of Endurance News are not intended to provide medical advice to individuals. For medical advice, please consult a licensed health care specialist.

The FDA has evaluated none of the statements in this newsletter.

(HOT WEATHER from page 1)

get from evaporation. This relationship between relative humidity and air temperature is quantified at http://anthro.palomar.edu/adapt/adapt_2.htm. When the apparent temperature is above 60°F. - 60% humidity, dehydration, hyponatremia, heat exhaustion and cramps are likely for humans. Much above 60°-60%, life threatening heat stroke may result [1].

Fluids (water) are absorbed in the stomach cavity first, then a few minutes later in the small intestines. Carbohydrates rely on sodium molecules to cross gut linings, so some sodium is absorbed with carbohydrates. However, sodium and chloride and potassium are absorbed at a high rate by the colon. Fluid loss and body core temperature elevation drive thirst to increase fluids and this is good to a point. But loading too much water volume without electrolytes may create a low serum sodium or hyponatremia, an event-ending medical emergency.

The ability to physiologically acclimate to hot conditions requires 14-21 days training in the heat. "The salt concentration of sweat progressively decreases while the volume of sweat increases. Urine volume also reduces.

In addition, vasodilation of peripheral blood vessels results in increased heat loss through radiation. Vasodilation also causes flushing, or reddening, of the skin since more blood is close to the surface." [2]

Tips for adaptation to the heat:

1. Distance Training @ Aerobic Pace 14-21 consecutive days
2. Train body to refuel, rehydrate, and process electrolytes during #1
3. Train at a reduced pace to compensate for overheating
4. Liquid Endurance 3-day hyperhydration loading protocol (trial in training first)
5. Dilute rehydration solutions slightly increase electrolytes
6. Increase fluid volume cautiously; resist drinking above 1 liter per hour [3]
7. Keep head, trunk, & quads WET to increase evaporative heat loss

The human body will adapt within 21 days aerobic heat stress exposure. (DO NOT wear extra clothing or plastic sweat suits to raise body core temperatures in preparation for a hyperthermic event). If body core temperatures exceed evaporative cooling rate, fluid loss and electrolyte loss will present as dehydration, tachycardia, excessive

heart rate, dizziness, gastric shutdown, performance deterioration, muscle cramping, and the athlete will be forced to reduce pace or stop exercising. When body core temperatures exceed the evaporative cooling rate, drinking cold fluids and emersion in cold water are the fastest remedies to reduce body core temperatures. Keep in mind, maintaining a slower pace (lower gears, easy cadence) in the heat may mean a better finish place over the course of a hyperthermic endurance event. It is best to be able to complete adaptive training in the heat with race event light colored clothing, exposing as much skin as possible. DO NOT wear skull caps in the heat, unless a crew supplies an ice packs often over the top of the head.

References

[1] Source: U.C. Berkeley Wellness Letter, August 1996
http://anthro.palomar.edu/adapt/adapt_2.htm

[2] Adapting to Climate Extremes
http://anthro.palomar.edu/adapt/adapt_2.htm

[3] When drinking above 34 fluid ounces per hour, the risk of dilutional hyponatremia increases (medical emergency)

50th Giro Lavenese : Riding in Italy

Brian Frank

I was fortunate to be able to spend a couple of weeks riding in northern Italy with some of my friends from the G.S. Berti cycling club recently. My good friend Carlo Vanini introduced me to this group in 1997. Since then, I have made biannual trips to do both local rides and extended tours with them throughout Italy. In the process, I have become good friends with many of them and learned much about enjoying the company of those you ride with as well as the amazing scenery.

On June 25th, I participated as an honorary member of the G.S. Berti club in the 50th annual Giro Lavenese. It's kind of like a well-organized Sunday ride that several

hundred cyclists from the area around Laveno Mombello, a small town on the northeast shore of Lago Maggiore, do each year. The route is a little over 100



Brian with some of his Italian buddies

kilometers, at a very easy pace and

socializing is the focus. Trophies are awarded afterwards for all kinds of reasons that I cannot remember, but they have nothing to do with who was the fastest or any other competitive goal. G.S. Berti received a cup for having the most club members do the ride, sort of like a team spirit award or something. The Giro Lavenese, like most of the social cycling clubs' events, is all about having fun riding with friends. If you ever have a chance to ride your bike in Italy, with or without locals, do whatever it takes to get there.

Be Like Jack and Bob

Tony Schiller

A couple days ago I found myself struggling a mile from the finish of the 10K run at the Timberman Triathlon when I got a boost. It was the sight of Jack Nelson slowing to dance his happy jig while being cooled by the mist spray coming from a young boy's garden hose. Jack was a mile into his 5k run as part of the sprint distance triathlon. Oh, did I mention that Jack will turn 84 in August?

Later at the awards ceremony, he and the youngster, 82-year old Bobby Powers, received a standing ovation for having swept the 80-84 division. As I watched these two happy, sharp, and youthful looking men take in the day, I thought, "I want to be just like them, racing into my 80's-and beyond."

In a recent article on proper race fueling, Hammer's Steve Born wrote that one of the most frustrating things that can happen to an athlete is seeing a race vaporize because of the wrong fueling. That's true, but I can think of

something far more frustrating: not being able even to start, due to an injury. And worse beyond imagination would be an avoidable career-ending injury caused by the wear and tear from years of racing and training through pain.

I wonder if that same fate could now be playing out for a 40-something former running champion I read about recently. As the article stated, this runner was "beating the odds" by racing again less than a year after reconstructive surgery, albeit, much slower these days. He said that going slower and always with pain is now just "part of the bargain." He also explained, "I just can't imagine a life without running."

I hope he never has to live without it either, but just play out the lifeline and what do you get? Do you see him dancing the happy jig like Jack and Bob in his 80's? How about in his 70's, or even 60's? What about you? How are you holding up?

Myself? I'd like to think I'm doing pretty well, above average compared to others with a third of a century of pounding the body by pouring on those miles. But no doubt there's been some damage, some of it irreparable. That's become obvious in recent years and that's why I now take a new, more long-term approach to sport. A little pain can no longer be "part of the bargain." If I want to be like Bob and Jack, with full mobility 20, 30 and even 40 years from now, the key is having full, pain-free mobility today, or something very close to it.

That means two big shifts are necessary:

- 1) The end to pain denial and any training that antagonizes your pain, and
- 2) A daily and life-long commitment to self-repair.

Implied in these two shifts is an almost endless list: everything from cross-training and alternative exercises like yoga, to flexibility work, rest, recovery and improved nutrition, plus massage, chiropractic care, and work

on proper posture and body mechanics.

I've written previously in this publication about an important new addition to my self-repair program: the use on a near-daily basis of the Compex Sport, an electrical stimulus device that speeds muscle recovery and increases muscle strength. Since purchasing the Compex a year ago, I've been able to say good-bye to a two-year long reoccurring calf-cramping problem that dumbfounded two doctors. Their best advice - aspirin and rest - got me nowhere. But within weeks of using the Compex, the two nearly golf-ball sized cramps started breaking up until they vanished completely months ago.

I've also used it to treat my other big problem area, the high hamstring strain, first injured as a college steeplechaser, which had gotten worse in recent years. While I can't claim total health yet for the hamstring, the treatments (which I am doing now as I write) are working. The adhesions are breaking up, and I'm more flexible in the hamstring and striding more easily than I have since 2003.

While I'd like to say I'm racing as fast as years ago, that'd be a lie. However, I do have something even better, a very healthy and nearly pain-free body. There's no doubt the Compex is part of the reason why. It will be a part of my training routine for years to come. Now if there was only some way to slow down some of those guys in their 20's and 30's just a bit. Oh well, I'm still beating Jack and Bob, at least for the time being. Hopefully, in another 35 years, I'll be just like them.

Tony Schiller, a top endurance athlete since the mid 1970's, has been a Hammer customer since 1988. In addition to his work as a corporate motivator, Tony does some coaching and is the director of the biggest kids' triathlon in America. Learn more at www.miraclekidstriathlon.org

For more information on the Compex Sport Muscle Stimulator, visit www.hammernut.com or call 800-366-1977 and talk to one of our expert customer representatives.



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(SODIUM from page 1)

(e.g., from your diet or a high-sodium electrolyte fuel) might temporarily relieve symptoms of hyponatremia, but it can also disable the hormone response mechanism, which mediates blood serum electrolyte concentration. In other words, consuming too much sodium will effectively hinder, even neutralize, the very mechanisms that are in place to help conserve the body's sodium levels and re-circulate sodium back in to the blood. When it comes to sodium, "more" is not necessarily "better"; in fact, you can create just as many problems by consuming too much as you can from consuming too little. This is a primary reason why we produce a low-sodium electrolyte product (Endurolytes). It helps to replenish depleted sodium (and other minerals) lost during exercise, but it doesn't overwhelm the body with so much sodium that it interferes with the body's natural sodium conservation system.

Sodium in the Diet

You'll hear a lot of so-called experts telling you that to ensure "best performances in the heat" (or something to that effect) you'll want to increase your sodium (salt) intake in your diet, especially in the days leading up to a hot-weather event. Of course, that's not our position. By consuming a high sodium diet, all you'll be doing is increasing the sodium concentration in your sweat and impair your body's sodium-regulating mechanisms. That sure doesn't sound like a performance-enhancing strategy to us.

So you may then be asking, "How much sodium do I really need?" The answer is probably less than you think. According to Dr. Bill Misner, "The human body needs very minute amounts of sodium to function normally. We need only 250 mg of sodium each day, athletes maybe 500 mg., which is easily supplied by natural, unprocessed foods." However, the average American diet supplies substantially more than that, approximately 6,000-7,000 mg or more daily. Clearly, taking in more sodium when most-to-all of us are already way overdoing it in the first place is not a wise strategy.

Even more important than the effects on athletic performance are the nega-

tive effects on general health caused by excess sodium (salt) consumption. When you look at the list of problems associated with chronic high sodium consumption (high blood pressure, congestive heart failure, gastric ulcers, liver disorders, and others), our position should come as no surprise. Excess dietary sodium/salt intake compromises health, period. We highly recommend a low-sodium diet.

Where We Stand

In the last issue of **Endurance News** we ran the article "Replace What You Lose, or What You Can Assimilate?" (if you missed this important information, you can also find it on our website) that discussed the problems athletes encounter when they try to replace all the calories, fluids, and electrolytes they lose during exercise. Our position on sodium intake is the same that we have on fluids and calories, and is summarized in Dr. Bill's words: "To suggest that fluids, sodium, and fuels-induced glycogen replenishment can happen at the same rate as it is spent during exercise is simply not true. Endurance exercise beyond 1-2 hours is a deficit spending entity, with proportionate return or replenishment always in arrears. The endurance exercise outcome is to postpone fatigue, not to replace all the fuel, fluids, and electrolytes lost during the event. It can't be done, though many of us have tried. The human body has so many survival safeguards by which it regulates living one more minute, that when we try too hard to fulfill all its needs we interfere, doing more harm than good. I continue to marvel that well intended 'experts' advice' to endurance athletes is to replace fluids, fuels, and electrolytes at the same rate they are lost. If that advice had merit, someone would be able to complete the 26th mile at the same pace as his or her 1st mile in a marathon on a hot and humid day."

Sodium conservation mechanisms are incredibly complex, and this article just touches on them. A more detailed explanation of our position on a low-sodium diet and low-sodium electrolyte replenishment product can be found in the following articles on our website:

The Endurolytes Rationale

www.hammernut.com/za/ECP?PAGE=

ARTICLE&ARTICLE.ID=770

The Role of Sodium to Prevent Hyponatremia During Endurance Events - A review of low-sodium intervention

www.hammernut.com/downloads/JOE/nov05.pdf

Solutions -Fuels, Fluids, & Electrolytes - For Endurance Performance

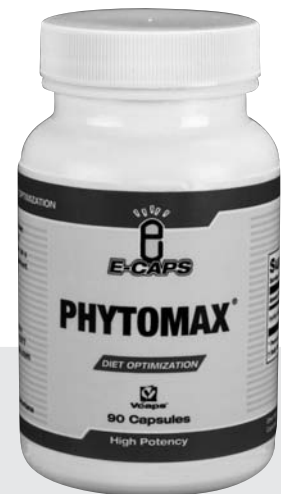
www.hammernut.com/downloads/solutions_performance.pdf

Oral Sodium Solutions Prevent Severe or Critical Hyponatremia

www.hammernut.com/za/ECP?PAGE=ARTICLE&ARTICLE.ID=1791

The Endurance Diet

hammernut.com/downloads/JOE/joe_sep05.pdf



Phytomax : It's here!!!

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There's just no easier way to get the nutrients you need. Order today.

Sodium : Does a high sodium diet inhibit endurance performance and health? *Bill Misner, Ph.D.*

Sodium makes up about 2.6% by weight of the Earth's crust making it the fourth most abundant element overall and the most abundant alkali metal. Sodium normally comprises 0.15% of body weight or a total of 95 grams of Sodium (mainly from Sodium Chloride). Sodium is necessary for regulation of blood and body fluids, transmission of nerve impulses, heart activity, and certain metabolic functions. Table salt is 40% sodium and 60% chloride molecules. Sodium is required for life, but over-consumption can increase the risk of health problems, including high blood pressure, in those individuals who are genetically predisposed to hypertension.

Sodium is one of the primary electrolytes in the body. Too much or too little salt in the diet can lead to an electrolyte disturbance, which can cause severe, even fatal, neurological problems. Too little sodium or diluting blood serum sodium is a life-threatening emergency, while chronic overdose above 2300 milligrams per day may increase blood pressure. Elevated blood pressure is regarded as one of the characteristics of progressive cardiovascular disease. Thus, too little sodium or too much sodium are mutually harmful to both heart health/efficiency and endurance performance [1-7].

The human body needs very minute amounts of sodium to function normally. We need only 250 mg of sodium each day, athletes maybe 500 mg., which is easily supplied by natural, unprocessed foods. Consumption of 12,000 mg (12 grams) or more of sodium per day is regarded as toxic. The average western diet contains 2.3-20 grams (2300 - 20,000 mg) of sodium per day. In 70 diets computer-analyzed from actual food-intake lists of athletes and non-athletes from 1996-2006, endurance athletes consumed between 6000-8000 mg sodium per day. However, aerobic exercise in the heat may spend whopping 2000 milligrams sodium per hour during evaporative cooling from profuse sweating. It is hypothesized that it is the rapid changes in serum sodium levels, which the body is not adapted,

(sodium losses more than sudden increase), that produce serious performance-inhibiting consequences. The athlete who is unconditioned and not acclimatized to high fluid & electrolyte losses will predictably suffer performance deterioration due to a low serum sodium or hyponatremic event. Research reports fit-acclimatized athletes need only 50% of the sodium required to maintain serum sodium levels as do unfit-unacclimatized [8-9] subjects. The more fit and the more trained & heat-exposed, the less sodium is required.

There are, however, other factors that may influence sodium requirements between subjects, further explaining why one person may require 1-3 Endurolytes/hour while another requires 6 per hour. Research implies that dietary sodium overdose may increase the risk of widening individual variations. A study of 1500 subjects reported that those who eat the most salt tend to have the highest blood pressure. The higher the blood pressure, the harder the heart works to sustain blood flow. The harder the heart works; the sooner onset of fatigue is generated. This study that reported an association between salt overdose and elevated blood pressure selectively involved men and women aged 16-64. They found that as daily salt intakes rose from 1600 mg/day to 9200 mg/day, so did blood pressure. A rise in salt consumption from 2300 mg/day to 4600 mg/day led to a whopping 7.1 mmHg rise in systolic blood pressure for women and a 4.9 mmHg rise for men [10]! Dietary sodium over- or under- dose may also explain why more individuals have problems the longer the event. A study was performed on 36 athletes during a three- to four- hour triathlon and 64 athletes at an Ironman race, which lasts between nine and 15 hours. No athletes were sodium deficient after the shorter race, but 27% were sodium deficient (hyponatremic) following the Ironman heat. An average of 17% of the Ironman participants required medical attention, most for hyponatremia (low or diluted serum sodium) [11].

How the body controls serum sodium

Aldosterone is a hormone that controls the rate of sodium circulated in the human body. Aldosterone is synthesized by the adrenal cortex. When sodium levels dip too low, aldosterone is released stimulating the kidney tubule cells to increase re-absorption of sodium back into the blood. Normal serum or plasma levels of aldosterone are dependent on the sodium intake and whether the patient is upright or supine. For males 6-22 ng/dl is normal, while 4-31 ng/dl is normal for females. High sodium intake will suppress serum aldosterone, whereas low sodium intake will elevate serum aldosterone. The reference intervals for serum (plasma) aldosterone are based on normal sodium intake. High Aldosterone levels occur in response to stress, renal dysfunction, adrenal cortical over-use, or pregnancy. If aldosterone is excessive serum and tissue levels of sodium will be excessive.

Characteristics of reduced performance associated with sodium, fluid & calorie imbalance

Of the endurance athletes reporting symptoms of severe sodium imbalance (between 1996-2006) following an endurance event, the following individual characteristics were observed:

1. Consumed from diet above 6000 mg sodium/day.
2. Consumed above 30 fluid ounces /hour.
3. Consumed above 300 calories/ hour.
4. Did not train in the same heat or humidity as the event.
5. Did not train above 60% of the event distance in hyperthermic conditions.

Characteristics of resolution of symptoms associated with sodium, fluid & calorie imbalance

(continued on next page)



In 100% of those who reported resolution of performance-inhibiting symptoms, the following individual characteristics were observed:

1. Increased electrolyte intake from Endurolytes between 3-6/hour.
2. Consumed between 24-28 fluid ounces/hour
3. Consumed 250-280 calories/hour
4. Trained 2-3 weeks in the same heat or humidity as the event.

High sodium health consequences

Limiting sodium is recommended since research supports that chronic consumption of more than 2300 milligrams per day may contribute to Congestive Heart Failure (CHF), Hypertension, Muscle Stiffness, Edema, Irritability, Osteoarthritis, Osteoporosis, Pre-Menstrual Syndrome (PMS), Liver disorders, Ulcers, and Cataracts. The American Heart Association (AHA) says that healthy American adults should eat no more than 2,300 milligrams of sodium a day. This is about 1 teaspoon of sodium chloride (salt).

To illustrate, the following are sources of sodium in the diet.

- 1/4 teaspoon salt = 575 mg sodium
- 1/2 teaspoon salt = 1,150 mg sodium
- 3/4 teaspoon salt = 1,725 mg sodium
- 1 teaspoon salt = 2,300 mg sodium
- 1 teaspoon baking soda = 1000 mg sodium

What high-sodium foods should be limited?

The following foods are high in sodium and should be limited in the diet:

Meat, Poultry, Fish And Other Meat Substitutes, Luncheon & Cured Meats, Processed Turkey/Chicken, Ham, Bologna, Salami, Bacon, Canadian Bacon, Corned Beef, Pastrami, Liverwurst, Frankfurters, Sausages, Dried Meat, Dried Fish, most Dairy, Processed Grains, Cereals, Soups, Snack Foods, Processed Vegetables, Spices,

Condiments, Sauces, Food Additives, all Canned Meats. It is Prostaglandin E2 overproduction from eating too much salted animal meat that induces the kidneys to retain excessive quantities of sodium. Other dietary manipulations to lower sodium are respectfully listed on the PAMF website. [13]

Conclusion

Evidence supports limiting sodium intake during rest and exercise. The harmful effect of more chronic sodium over-dose above the body's daily need is a real and present danger to compromise optimal health. Tight chemical messengers and hormones help the body to spare serum sodium loss. It only takes a few hundred milligrams every 15-20 minutes in the hottest environment to sustain aerobic pace. This assumes that fluid intake does not exceed 30-fluid ounces per hour or that calorie consumption exceeds 300-calories per hour.

References

1. American Heart Association Consumer Publications
<http://www.americanheart.org/presenter.jhtml?identifier=4423>
2. Dietary Guidelines for Healthy Children
<http://www.americanheart.org/presenter.jhtml?identifier=4575>
3. High Blood Pressure
<http://www.americanheart.org/presenter.jhtml?identifier=4623>
4. High Blood Pressure, Factors That Contribute To
<http://www.americanheart.org/presenter.jhtml?identifier=4650>
5. High Blood Pressure, What Can Be Done
<http://www.americanheart.org/presenter.jhtml?identifier=4630>
6. Risk Factors and Coronary Heart Disease
<http://www.americanheart.org/presenter.jhtml?identifier=4726>
7. Sodium Guidelines Set by the FDA
<http://www.americanheart.org/presenter.jhtml?identifier=4718>
8. Shepherd, R.J., Kavanagh, T., Fluid and Mineral Needs of Middle Aged and Post Coronary Distance Runners. The Physician And Sports Medicine. May, 1978: 90-102.
9. Verde, T., et al., Sweat Composition in Exercise and Heat. J Appl Phys. 1982; 53(6): 1541-1543.
10. In Arch Intern Med 1997; 157:234-238.
11. Hiller WD et al., Medical and physiological considerations in triathlons. Am J Sports Med. 2:164-167, 1987.
12. AHA Sodium Recommendation
<http://www.americanheart.org/presenter.jhtml?identifier=4708>
13. Palo Alto Medical Foundation
<http://www.pamf.org/heartfailure/lifestyle/diet/foods.html>

NOTES FROM BRIAN & STEVE

It's interesting to note that Dr. Bill's 10-year nutritional analysis of hundreds and hundreds of athletes showed that their diets reflected the same high sodium consumption as the "typical Western diet." The take-home message here is that when we talk about someone consuming a high sodium diet, we are, quite frankly, talking about all of us: you, me, and virtually every other athlete, active person, and sedentary person.

Perhaps an even more interesting to note is the 100% success rate - that's right, a 100% success rate - when specific fueling recommendations are applied, recommendations that don't suggest using more but amounts that are more conservative and cooperate with the body's hormonal mechanisms. Yes, you'll find a number of so-called "experts" telling you that more is better, and, as a result of these experts' recommendations, chances are you're going to see more and more companies that keep jacking up the sodium content as though that's the answer to the problem.

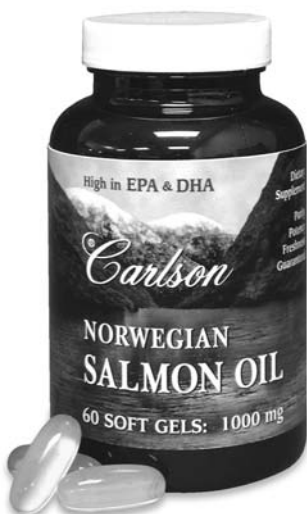
The bottom line, however, is that excess sodium consumption has serious negative health implications (I can't think of anyone who'd want to deal with any of the problems that Dr. Bill listed in his article), which is the primary reason for adopting a low-sodium diet. In addition, high sodium intake during exercise will not improve your chances for success and, in fact, may be a primary factor in ruining a race for you. Why? Because it goes against your body's built-in mechanisms for how it monitors sodium excretion. When it comes to sodium intake during exercise the same concept is true as it is for fluid and calorie consumption: Give your body a helping hand (the support it needs) but don't kill it with kindness.

I know that we've got "broken record syndrome" in that we're always recommending and repeating the "replenish what your body can assimilate, not what it loses" mantra. Well, I guess we're just going to have to live with that because we're not going to back down from this position. We are absolutely convinced that this is the proper way to fuel and we will continue to trumpet this message. Why? Because our desire is to help you achieve your health and athletic goals, simple as that.

Recent Research : Omega-3 fatty acids have positive effect on heart rate

Effects of Omega-3 Fatty Acids [Docosahexaenoic Acid (DHA) and Eicosapentaenoic Acid (EPA)] on Resting Heart Rate, Heart Rate Recovery After Exercise, and Heart Rate Variability in Men With Healed Myocardial Infarctions and Depressed Ejection Fractions, O'Keefe JH Jr., Abuissa H, et al, *Am J Cardiol*, 2006; 97(8): 1127-1130. (Address: Mid America Heart Institute, 4401 Wornall Rd., Saint Luke's Hospital, Kansas City, Missouri, 64111, USA; University of Missouri-Kansas City School of Medicine, Kansas City, Missouri, 64108-2792, USA).

In a randomized, double-blind, placebo-controlled, crossover study involving 18 white males with a history of myocardial infarction and ejection fractions less than 40%, treatment with omega-3 fatty acids for a period of four months was found to reduce heart rate (HR), improve 1-minute HR recovery



after exercise, and improve HR variability in the high-frequency band. Subjects were divided into two groups. For four months, one group was given an omega-3 fatty acid supplement containing 585 mg of DHA and 225 mg of EPA daily, while the other group was given a placebo. After this first four-month period, the groups were crossed over for another four months. Results found that after daily supplementation with the omega-3 fatty acid supplement, resting HR decreased from 73 beats per minute after placebo to 68 beats per minute, and 1-minute HR recovery after exercise improved, from -27 while taking placebo to -32 beats per minute while taking omega-3 fatty acids. While no change was found in overall HR variability, an increase was

found in HR variability in the high-frequency band, indicating improved parasympathetic activity. No significant changes were found in blood pressure, arterial compliance, lipids or inflammatory markers.

The results of this study, suggesting an increase in vagal activity an improvement in autonomic balance, may in part help to explain the previously observed decrease in risk of sudden cardiac death associated with omega-3 fatty acid supplementation. These results suggest that omega-3 fatty acids, even in the low-doses used in this study, may benefit cardiovascular and overall health by decreasing resting heart rate and accelerating the return to normal heart rate following exercise.

Dr. Bill's Bits of Wisdom

"What is the metabolic donation to energy cycle demand if preservative-bound? Preservatives for shelf-lasting are also used to embalm dead people to prolong their state on the "Shelf", with no observed benefit for the living of life in the endurance lane..."
- Bill Misner, Ph.D.

53x11 Coffee : Crank it up!

53x11 Coffee Company is a new venture created by pro cyclists Evan Lawrence and Owen Gue, the same duo that runs the Cycling House Winter Training Camp (www.thecyclinghouse.com) in Tucson Arizona. I started sponsoring them in 2001, and our relationship has grown over the years, due to their excellent work ethic, loyalty and integrity. Their passion for riding, good coffee, and environmental stewardship all come together in this new company, and we're very happy to be among the first to sell their wares. The next issue of **Endurance News** will have more details on the two businesses that these young entrepreneurs have created, all while racing full time.

Here's what Evan and Owen have to say about their coffee:

53x11 coffees are 100% fair trade, certified organic and have the taste of victory. The Fair Trade Certified label guarantees that farmers and workers receive a fair price for their product, so that these farmers can feed their fami-

lies and have their children attend school instead of working in the fields. Certified Organic means that the producers do not use conventional farming methods, such as harmful pesticides or environment-damaging deforestation. This is of critical importance since coffee is the most heavily sprayed crop in the world. 53x11 coffee beans come from farmers who use renewable resources, respect soil and water conservation, and seek to enhance environmental quality for future generations. Our Big Ring coffee is also shade grown under a canopy of diverse species of trees that provide a viable habitat for migratory birds.

We currently offer two amazing brews to kick start your day. Early Break is a unique blend of beans from Peru, Guatemala, Mexico, Sumatra, and El Salvador. It is medium roasted

for a rich body and flavor and mild acidity. Big Ring is 100% Sumatran, with superb richness, an extraordinary full-body, and low acidity. Both brews come as whole beans to give you the fullest flavor possible. They are priced at \$13.95 per 12 ounce bag, shipping included.



Ride ready.

If you enjoy our coffee as much as we do, you'll want to sign-up for the Coffee Club. Members receive a special price on their monthly shipments of fresh roasted, one-way valve sealed beans. Drink 53x11 Coffee and ride ready! Check out www.53x11coffee.com for more details.

We expect to begin shipping coffee by mid-August. Also, look for 53x11 Coffee at www.hammernut.com and in the 2007 Hammer Nutrition catalog.

Ride ready!



2006 RAAM : What a ride

The 2006 edition of the Race Across America (RAAM) is in the books, and we at Hammer Nutrition are pleased to have once again sponsored this epic race, considered by many to be the world's toughest endurance event.

Beginning at a new starting location in Oceanside, CA, the solo competitors rode off to certain pain, but potential glory, on Sunday morning, June 11. The 2-person, 4-person, and 8-person corporate teams rolled out two days later, on Tuesday afternoon. This year's 3043-mile route, containing 108,600 feet of climbing, went through 13 states (California, Arizona, Utah, Colorado, Kansas, Missouri, Illinois, Indiana, Ohio, West Virginia, Maryland, Pennsylvania, New Jersey) and featured some of the epic sections from past RAAMs, including the three major climbs in Colorado - Wolf Creek Pass (10,857'), La Veta Pass (9413'), and Cuchara Pass (9941').

While continuing to have a traditional "no specific sleep requirements" RAAM format, which many of the riders opted for, this year's RAAM featured a new and exciting category, the Solo Enduro division, which is described on the RAAM website (www.raceacrossamerica.org) thusly: "Slightly more humane than the Solo Traditional division, it focuses the contest more on cycling speed and less on the ability to survive on minimal sleep." Race director Jim Pitre discussed this new division in RAAM, saying, "Our changes are intended, in part, to place a greater emphasis on cycling ability and increase speed while the riders are on the bike. By imposing an equal off-the-bike-time for all riders, some different race strategies will be introduced that will challenge all concerned."

Unlike the traditional RAAM category, where competitors usually ride for 21 or more hours non-stop every day, the Solo Enduro division required competitors to take a minimum of 40 hours off their

bikes. As described on the RAAM site, "In total there will be twenty control points across the nation. At five of these, Solo Enduro riders will be obliged to stop for a minimum period of two hours. The control points with mandatory stops are spaced roughly 500 miles apart from each other. At the remaining 15 control points, riders have the option of stopping to take sleep breaks or pressing on. At the end of the race, up to 40 hours of stoppage time will be subtracted from each rider's total elapsed time - but only stops taken at control points will receive this credit."



Shanna suits up for another day of riding

Hammer Nutrition was well represented at this year's RAAM with several riders using E-CAPS supplements and

Hammer Nutrition fuels. Shanna Armstrong (featured in Endurance News #49) was one of two solo women, and the lone finisher, winning the Women's division in a time of 11 days, 22 hours, 16 minutes. Marko Baloh took second (behind cycling legend Jonathan Boyer) in the Men's Solo Enduro division, with a time of 10 days, 9 hours, 28 minutes. In the Men's Solo Traditional division, David Haase was the top American, finishing fourth overall in a time of 9 days, 21 hours, 41 minutes. Guus Moonen, of The Netherlands, took sixth place with a time of 10 days, 16 hours, 46 minutes. In the 8-person Corporate division, Team Type 1 set a new average speed record of 22.36 mph, and a new race record of 5 days, 16 hours, 4 minutes, finishing a nearly a full day (22 hours) ahead of the second-place team. Phil Southerland, the leader of Team Type 1, recently wrote me saying, "Thanks to your products, and your crafty formula for using them, we had a very successful RAAM. I truly believe that it is because of E-Caps and Hammer Nutrition that we were able to not only set, but smash the record."

You can find more information and complete race results from this year's RAAM at www.raceacrossamerica.org

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Ask Dr. Bill

Bill Misner, Ph.D.

QUESTION : Why should I add protein to post-exercise carbohydrate meals? What does that do and how does it benefit recovery and performance?

ANSWER : I am asked often to support the hypothesis that proposes adding protein to carbohydrates following glycogen-depleting endurance exercise. The actual mechanisms are not (yet) well understood nor explained, but we are beginning to understand partially why it is advantageous to add protein to carbohydrates after exercise. Some research (not listed) reports the immune system is bolstered stronger than if no protein is consumed with carbohydrates. Some research (not listed) supports 1:1 CHO:PRO, while others argue 3:1 or 4:1 CHO:PRO ratio... since glycogen storage is the major endurance-limiting substrate, according to graduate-level sports nutrition texts, there are 5 papers with findings associated with this hypothesis:

Ivy et al, (1) examined the effect of a carbohydrate-protein supplement on endurance performance during exercise of varying intensity. Increasing the plasma glucose and insulin concentrations during prolonged variable intensity exercise by supplementing with carbohydrate has been found to spare muscle glycogen and increase aerobic endurance. Furthermore, the addition of protein to a carbohydrate supplement will enhance the insulin response of a carbohydrate supplement. The purpose of the present study was to compare the effects of a carbohydrate and a carbohydrate-protein supplement on aerobic endurance performance.

Nine trained cyclists exercised on 3 separate occasions at intensities that varied between 45% and 75% VO₂max for 3 h and then at 85% VO₂max until fatigued. Supplements (200 ml) were provided every 20 min and consisted of placebo, a 7.75% carbohydrate solution, and a 7.75% carbohydrate/1.94% pro-

tein solution. Treatments were administered using a double-blind randomized design. Carbohydrate supplementation significantly increased time to exhaustion (carbohydrate 19.7 +/- 4.6 min vs. placebo 12.7 +/- 3.1 min), while the addition of protein enhanced the effect of the carbohydrate supplement (carbohydrate-protein 26.9 +/- 4.5 min, p < .05). Blood glucose and plasma insulin levels were elevated above placebo during carbohydrate and carbohydrate-protein supplementation, but no differences were found between the carbohydrate and carbohydrate-protein treatments. In summary, we found that the addition of protein to a carbohydrate supplement enhanced aerobic endurance performance above that which occurred with carbohydrate alone, but the reason for this improvement in performance was not evident.

Miller et al., (2) likewise examined the metabolic response to a provision of mixed protein-carbohydrate supplementation during endurance exercise.

The interaction of substrates and hormones in response to ingestion of intact proteins during endurance exercise is unknown. This study characterized substrate and hormone responses to supplementation during endurance exercise. Nine male runners participated in 3 trials in which a non-fat (MILK), carbohydrate (CHO), or placebo (PLA) drink was consumed during a 2-hour treadmill run at 65% VO₂max. Circulating levels of insulin, glucagon, epinephrine, norepinephrine, growth hormone, testosterone, and cortisol were measured. Plasma substrates included glucose, lactate, free fatty acids, and select amino acids. Except for insulin and cortisol, hormones increased with exercise. While post-exercise insulin concentrations declined similarly in all 3 trials, the glucagon increase was greatest following MILK consumption. CHO blunted the post-exercise increase in growth hormone compared to levels in MILK.

Free fatty acids and plasma amino acids also were responsive to nutritional supplementation with both CHO and MILK attenuating the rise in free fatty acids compared to the increase observed in PLA. Correspondingly, respiratory exchange ratio increased during CHO.

(continued on next page)

Essential amino acids increased significantly only after MILK and were either unchanged or decreased in CHO. PLA was characterized by a decrease in branched-chain amino acid concentrations.

Modest nutritional supplementation in this study altered the endocrine response as well as substrate availability and utilization following and during an endurance run, respectively.

Tarnopolsky et al., (3) reported post exercise protein-carbohydrate and carbohydrate supplements increase muscle glycogen in men and women. They previously demonstrated that women did not increase intramuscular glycogen in response to an increased percent of dietary carbohydrate (CHO) (from 60 to 75% of energy intake) (M. A. Tarnopolsky, S. A. Atkinson, S. M. Phillips, and J. D. MacDougall. *J. Appl. Physiol.* 78:1360-1368, 1995).

CHO and CHO-protein (Pro) supplementation post exercise can potentiate glycogen resynthesis compared with placebo (K. M. Zawadzki, B. B. Yaspelkis, and J. L. Ivy. *J. Appl. Physiol.* 72: 1854-1859, 1992). We studied the effect of isoenergetic CHO and CHO-Pro-Fat supplements on muscle glycogen resynthesis in the first 4 hours after endurance exercise (90 min at 65% peak O₂ consumption) in trained endurance athletes (men, n = 8; women, tested in midfollicular phase, n = 8). Each subject completed three sequential trials separated by 3 wk; a supplement was provided immediately and 1-h postexercise: 1) CHO (0.75 g/kg) + Pro (0.1 g/kg) + Fat (0.02 g/kg), 2) CHO (1 g/kg), and 3) placebo (Pl; artificial sweetener). Subjects were given prepackaged, isoenergetic, isonitrogenous diets, individualized to their habitual diet, for the day before and during the exercise trial. During exercise, women oxidized more lipid than did men ($P < 0.05$). Both of the supplement trials resulted in greater post exercise glucose and insulin compared with Pl ($P < 0.01$), with no gender differences. Similarly, both of these trials resulted in increased glycogen resynthesis (37.2 vs. 24.6 mmol · kg dry muscle⁻¹ · h⁻¹, CHO vs. CHO-Pro-Fat, respectively) compared with Pl (7.5 mmol · kg dry muscle⁻¹ · h⁻¹; $P < 0.001$) with no gender differences. They concluded that post exercise CHO and

CHO-Pro-Fat nutritional supplements can increase glycogen resynthesis to a greater extent than Pl for both men and women.

Zawadzki et al., (4) compared carbohydrate, protein, and carbohydrate-protein supplements to determine their effects on muscle glycogen storage during recovery from prolonged exhaustive exercise. Nine male subjects cycled for 2 h on three separate occasions to deplete their muscle glycogen stores. Immediately and 2 h after each exercise bout, they ingested 112.0 g carbohydrate (CHO), 40.7 g protein (PRO), or 112.0 g carbohydrate and 40.7 g protein (CHO-PRO). Blood samples were drawn before exercise, immediately after exercise, and throughout recovery. Muscle biopsies were taken from the vastus lateralis immediately and 4 h after exercise. During recovery the plasma glucose response of the CHO treatment was significantly greater than that of the CHO-PRO treatment, but the plasma insulin response of the CHO-PRO treatment was significantly greater than that of the CHO treatment. Both the CHO and CHO-PRO treatments produced plasma glucose and insulin responses that were greater than those produced by the PRO treatment (P less than 0.05). The rate of muscle glycogen storage during the CHO-PRO treatment [35.5 ± 3.3 (SE) mmol · g protein⁻¹ · h⁻¹] was significantly faster than during the CHO treatment (25.6 ± 2.3 mmol · g protein⁻¹ · h⁻¹), which was significantly faster than during the PRO treatment (7.6 ± 1.4 mmol · g protein⁻¹ · h⁻¹). The results suggest that post exercise muscle glycogen storage can be enhanced with a carbohydrate-protein supplement as a result of the interaction of carbohydrate and protein on insulin secretion.

Ivy et al., (5) concluded that early postexercise muscle glycogen recovery is enhanced with a carbohydrate-protein supplement. They tested the hypothesis that a carbohydrate-protein (CHO-Pro) supplement would be more effective in the replenishment of muscle glycogen after exercise compared with a carbohydrate supplement of equal carbohydrate content (LCHO) or caloric equivalency (HCHO). After 2.5 ± 0.1 h of intense cycling to deplete the muscle glycogen stores, subjects (n = 7) received, using a rank-ordered design, a CHO-Pro (80 g CHO, 28 g Pro, 6 g fat), LCHO (80 g

CHO, 6 g fat), or HCHO (108 g CHO, 6 g fat) supplement immediately after exercise (10 min) and 2 h post exercise. Before exercise and during 4 h of recovery, muscle glycogen of the vastus lateralis was determined periodically by nuclear magnetic resonance spectroscopy. Exercise significantly reduced the muscle glycogen stores (final concentrations: 40.9 ± 5.9 mmol/l CHO-Pro, 41.9 ± 5.7 mmol/l HCHO, 40.7 ± 5.0 mmol/l LCHO). After 240 min of recovery, muscle glycogen was significantly greater for the CHO-Pro treatment (88.8 ± 4.4 mmol/l) when compared with the LCHO (70.0 ± 4.0 mmol/l; $P = 0.004$) and HCHO (75.5 ± 2.8 mmol/l; $P = 0.013$) treatments. Glycogen storage did not differ significantly between the LCHO and HCHO treatments. There were no significant differences in the plasma insulin responses among treatments, although plasma glucose was significantly lower during the CHO-Pro treatment. These results suggest that a CHO-Pro supplement is more effective for the rapid replenishment of muscle glycogen after exercise than a CHO supplement of equal CHO or caloric content.

SUMMARY

Endurance athletes should experiment with a meal recovery protocol that contains carbohydrate and protein, not simply carbohydrate alone. The best time to consume this meal is the first 30 minutes after exercise to take advantage of the limited post-exercise enzymes & hormonal carrier availability.

References

- 1) Ivy JL, Res PT, Sprague RC, Widzer MO. Effect of a carbohydrate-protein supplement on endurance performance during exercise of varying intensity. *Int J Sport Nutr Exerc Metab.* 2003 Sep;13(3):382-95. PMID: 14669937 [PubMed - indexed for MEDLINE]
- 2) Miller SL, Maresh CM, Armstrong LE, Ebbeling CB, Lennon S, Rodriguez NR. Metabolic response to provision of mixed protein-carbohydrate supplementation during endurance exercise. *Int J Sport Nutr Exerc Metab.* 2002 Dec;12(4):384-97. PMID: 12500983 [PubMed - indexed for MEDLINE]
- 3) Tarnopolsky MA, Bosman M, Macdonald JR, Vandeputte D, Martin J, Roy BD. Postexercise protein-carbohydrate and carbohydrate supplements increase muscle glycogen in men and women. *J Appl Physiol.* 1997 Dec;83(6):1877-83. PMID: 9390958 [PubMed - indexed for MEDLINE]
- 4) Zawadzki KM, Yaspelkis BB 3rd, Ivy JL. Carbohydrate-protein complex increases the rate of muscle glycogen storage after exercise. *J Appl Physiol.* 1992 May;72(5):1854-9. PMID: 1601794 [PubMed - indexed for MEDLINE]
- 5) Ivy JL, Goforth HW Jr, Damon BM, McCauley TR, Parsons EC, Price TB. Early postexercise muscle glycogen recovery is enhanced with a carbohydrate-protein supplement. *J Appl Physiol.* 2002 Oct;93(4):1337-44. PMID: 12235033 [PubMed - indexed for MEDLINE]



Team Rite Aid presented by Snow Valley

Each issue we usually feature a solo athlete in our "Athlete Spotlight" section. This issue we thought we'd do something a little different and feature an entire team. Team Rite Aid (formerly Team Snow Valley), based out of Wayne, Pennsylvania, is one of our long-time sponsored professional teams. We're proud and excited to be sponsoring them again this year. The team includes:

*Jon Wirsing - Sandy Hook, VA
Josh Taylor - Alburtis, PA
Ryan DeWald - Intercourse, PA
John DeLong - Reading, PA
Zach Bell - Watson Lake, Yukon
Brad Viera - Lancaster, PA
Russell Langley - Washington, DC
Christoph Herby - Geneva, Switzerland
Peter Penzell - Annapolis, MD
Mike Beers - Patterson, JN*

So far this year, Team Rite Aid has had some very impressive results with top finishes at Spring races such as Virginia's Hampton Roads Cycling Classic and Tour of Shenandoah, and the Joe Martin Stage Race in Arkansas.

I had a chance to catch up with one of the Team Directors, Jon Wirsing, and one of the Directing Managers, Arch McKown.

EN: In mid-April the team was in the People's Republic of China, participating in the Tour of Chongming Island. You were the only American team invited to participate in this five-day stage race, and you competed against teams from the United Kingdom, France, Australia, South Africa, Kazakhstan, Mongolia, Thailand, Hong Kong, Taiwan, and six teams from China. What was that experi-

ence like for the team, and were you pleased with the results the team achieved?

Arch: It was fascinating for so many reasons. UCI Pro races are very different from Pro 1-2 races in the States, to begin with. But being in China for the first time, against unknown riders, was a big difference. We had an idea who would be the strong teams prior to day one, but it took a couple days to really figure out tactics. The teams from Australia and South Africa were riding so strong because they already had thousands of race miles in their legs for this season. The Euro guys seem to always be strong and suited for riding for five hours into crosswinds. It took a few days for the jet lag to wear off, and also for our riders' legs to get accustomed to the rhythm of the race. By day three (of five) our riders were firing on all cylinders and able to get into breaks and attack and finish solidly in the money. The food was a challenge - "Chinese food" over here is apparently very different from their food! We raided the local grocery store of all their yogurt, oatmeal, soymilk, and Cheerios! Fortunately, we came loaded with Hammer and E-Caps products. With all the guys taking Premium Insurance Caps, Endurolytes, Race Caps Supreme, Perpetuem, Hammer Bars, Hammer Whey, and Anti Fatigue Caps, among other Hammer products, we had a good nutritional foundation, even if our meals were not what the riders were used to eating. Our guys would've bonked everyday if they relied solely on available food there, like fried pig's knuckle and sparrow's stomach! It was certainly a learning experience, and our guys really took a lot of positives away from the trip.

Jon: As well it has generated a large interest in our team. I've already received resumes from some of the riders that were in attendance. We also received a great deal of interest for the '07 season in terms of participation. We have been asked to return to the Tour of Chongming Island and have been asked if we would participate in the Tour of Taiwan and the Milk Race.

EN: You've got a packed schedule all the way through the middle/end of September. Obviously, you'd like to have the team do well in all the races, but which ones are you really pointing towards... your "A"

races, so to speak?

Arch: That's a good question - Jon - what do you think?? We like to make an impact in all the races we enter. We've had good luck at Tour de Toona in the past, so that's obviously a priority race to do well there.

Jon: We've also had a lot of bad luck at Tour de Toona. One of my riders has crashed five years in a row there. In those same five years we've been on the podium at the stage finishes and have won the sprint jersey. Definitely Tour de Toona, we'll be going to make an impact-whether that's in the GC, stages, or Points jersey we'll see how things play out by the end of Stage 3. Pretty much August is our focus. Bank of America in NC, Tour of Elk Grove, IL, and Criterium National Championships all fall in the first three weeks following Tour de Toona. We have a very fast sprinter; those events could be very good for the team.

EN: Which team(s) do you see as being your toughest competition in your upcoming races?

Arch: The bigger pro teams, like Healthnet, Toyota-United, Navigators, Colavita. Usually they set the tone for the race. It would be easy to say they are the toughest competition since they have the most horsepower. But then you have smaller pro teams and strong amateur teams that get their licks in. Going into each race, it helps to know who's going well, and what riders are suited for that type of race course/condition. So, it can really vary from week to week.

EN: Can you tell us a little bit about each of the riders on the team, how long they've been on the squad, what their strengths are, etc?

Jon: I started the elite team for Snow Valley in 1995. Arch recruited me and asked me if I could develop a strong regional Cat 1-2 team. A little history: I started racing as a junior 14-15 (different age breakdown back then) in 1985. I raced three years as a junior with limited racing (20 - 30 races a year and most of them were club races). In my first year I qualified for Nationals and time trials were clearly my strength. I co-founded the collegiate cycling team at Liberty University in 1988-1989, and spent my first season in Pro 1-2 races

racing with Athletes in Action. I was getting pounded by Coors Light, 7-11 and a variety of other pros. I kept racing, finished my undergraduate degree, got married and started a graduate assistantship. Graduated with an M.S. in Human Performance and started teaching Elementary Physical Education. That's the time that I joined Snow Valley. The next five years were spent building the program. By 2001 I had been on the podium at national championships, multiple NRC events, and was pretty consistent as the top amateur in many of the East Coast NRC events.

In 2001 Brian Walton came on board as our director. I initially left the team and signed with Noble House (interesting story there). Continued to ride with Snow Valley until Rite Aid Pro Cycling emerged for 2006. In the midst of all this, we (Karen and I) just celebrated our 14th wedding anniversary and have two awesome kids: Christian, 7, and Anna Kate, 4. I still work in education, but I deal with the technology side, not the classroom. My strengths have changed over the course of time. One strength that has evolved is race tactics. I've always been an information person. I read it, see it, watch it, research it, evaluate it, and apply it. It also doesn't hurt now that I've raced close to 1000 races at this point. Probably my strongest asset is my passion for the sport, tenacity, and heart during the races.

Josh Taylor - This is Josh's second year with the team. He came on board as part of our management team and is a rider/manager. Josh is one of the few Spinning Master Instructors in the country. His legs can be seen on some of the sleeves of the spinning videos. He's a rider that rides off of emotion and puts his heart into his job. He will lay it on the line for any of his teammates. He excels in courses that are constantly up and down. In high school Josh was a Junior Olympic volleyball player. I believe he is also the only rider on our squad who has been bitten by a rattlesnake.

Zach Bell - Zach is new to us this year

and has received a number of nicknames. The first was the Canadian Cannon. He is 23 years old and is completing his first full season on the road. He was a high school and college wrestler with his eyes set on the Olympics. He still has his sights on the Olympics, but via the great oval of the



Rite Aid China Squad

track. He is the '04 and '05 Canadian national champion in the pursuit. He first year racing was 2003! This season he broke Brian Walton's 13 year-old Canadian Pursuit record, placed top 10 in a World Cup event, took a Bronze medal at the Pan Am championships and 14th at the World championships. He is still feeling out his first full season on the road, but has already claimed a couple victories and has been on the podium a number of times. Besides Zach's strength in the sprint, he has a strong work ethic, and is very focused on reaching his goals in the next couple of years.

Brad Viera - Brad is in his third year with the team. He started with us after finishing his Junior years with the Hot Tubes Program. At the young age of 21, he has a great wealth of racing experience. He's raced more than 50 races in Europe and has raced most of the major events in the US. He has spent part of the last few years riding part-time with the US U23 team. Brad is an all-around rider. He can climb, time trial, and sprint. He has great family support and a very solid head on his shoulders. He's driven to reach as high as he can, and also is continuing his schooling during the fall. If he continues down the same path, he will have a

fantastic future in the sport. He's so far ahead of many others his age and older.

John DeLong - John is in his second year with the team. John is a survivor. Make the race hard and long, and John will be there in the end. He will push himself to the point of collapsing. You would never see that in normal conversation; by far he's the quietest guy on the team. A recent graduate from Virginia Tech, he also has spent some time racing in Europe and he also rode with the Saturn Development team.

Christoph Herby - Recent graduate with a double major from the University of Virginia. Christoph loves to travel. His Dad lives and works in Switzerland and his Mom is in Virginia. Christoph broke out of his shell last year in his first year with the team. When the road went uphill he was ready to go. He's one of our GC contenders for hilly stage races. This year, he won the KOM jersey at the Tour of Shenandoah.

Peter Penzell - Peter is currently the US Military Champion. This is almost by default, as the Military championships haven't been held in the last two years and he by default keeps retaining his title. This is Peter's second year with the team, but it's his first year as a pro. Peter was brought on because of his incredible work ethic and commitment to the team. He's found his niche in being a crucial part of the team's leadout train. In addition to Peter's current employment as a Navy Officer, he owns and operates Phat Cat Customs (www.phatcatcustoms.net), a high-end custom bicycle designer and fabricator.

Ryan DeWald - This is Ryan's third year with the team. Ryan is an unknown talent. He can climb, sprint, and ride a good TT. He's a rider that likes to have a good time and can always lift your spirits with a story. He's just learning how to tap into his huge abilities and now has a coach that will bring the best out of him in the next couple of years.

(see RITE AID on page 15)



Steve Born : Senior Technical Advisor

Welcome to the mid-summer edition of Endurance News!

I hope that you're having a great summer and your training and racing has been going according to plan, or even better.

Every issue of Endurance News features a number of athlete results, but we simply don't have the space to print all the results we receive. However, please know that we do read all athlete updates (by the way, the new email address is athleteupdates@hammer-nut.com), and even if we can't print everyone's successes, we want you to know how genuinely excited we are when we read what you've accomplished. Please, keep those race results coming! Also, we can always use good action photos of our athletes wearing Hammer logo clothing. You can send those to anock@hammer-nut.com.

Primal Quest Utah

In this issue of EN you'll find an article about one of the world's most difficult races, the annual Race Across America transcontinental bicycle race. Not as well known, but perhaps even more brutal in its own way, is the Primal Quest adventure race, which ran from June 25 to July 4. Here's how their website describes the race: "The ultimate test of human endurance, selfless teamwork, and relentless determination - Primal Quest® is the world's toughest Expedition Adventure Race®. Covering over 800km and lasting up to 10 days, co-ed teams of four travel non-stop using only a map and compass to navigate this grueling and unforgiving course. Held in a new international location each year,

From the Saddle of Steve Born

adventurers from all over the world run, bike, paddle and traverse the rugged terrain in the quest to reach the finish line. For all teams, to simply complete Primal Quest® is a remarkable achievement and the culmination of an incredible journey. Primal Quest 2006 will be an historic moment in the world of endurance racing. It will be the largest expedition adventure race ever staged, featuring the best teams in the sport and long-shot amateurs experiencing a true expedition. Top teams will be battling for the largest prize purse in the sport: \$250,000 USD. Amateur teams will be battling to finish - itself an enormous accomplishment. Primal Quest® is the last remaining major expeditionary adventure race, and has been purposefully designed to plumb the most remote areas of the trackless American West. From raging river swims to endless, arid treks and tens of thousands of feet of vertical gain and loss, the athletes will be challenged in innumerable ways."

Eighty-nine teams competed in this prestigious race and only 28 completed the course...now that's one tough race! We'd like to recognize our sponsored teams for their top 10 finishes: Team Sole (Karen Lundgren, Paul Romero, Aaron Linn, Kris Lausen), 7th place and Team Spyder (Danelle Ballengee, John Jacoby, Dave Mackey, Travis Macy), 9th. Other top-25 teams using Hammer Nutrition products were Team 24Seven (Ernie Chilcott, Beth Reyburn, Charlie Roberts, Pete Stilwell), 22nd, and Team Adventure Pocono (Daphne Hoyt, Derek Lawrence, Peter Spagnoli, Brian Reiss), 24th. Mega-congratulations to all of you!

Upcoming Events

To say that our calendar of events is full is an understatement! I think we sponsored over 200 events in June, and we're sponsoring even more in July. Here's a sampling of upcoming events:

Spirit of Racine Triathlon

July 23 - Racine, WI

(www.spiritofracinetri.com)

Kiehl's Badwater Ultramarathon

July 24-26 - Death Valley, CA

(www.badwater.com)

Jay Challenge

July 28-30 - North Troy, VT

(www.jaychallenge.com)

24 Hours of Booty

July 28-29 - Charlotte, NC

(www.24hoursofbooty.com)

24 Hours of 9 Mile-

2006 National 24 Hour

Championship

July 29-30 - Wausau, WI

(www.24-9.com)

Troika 1/2 Iron Triathlon / Endurance Duathlon

August 6 - Spokane, WA

(www.racecenter.com/troika)

24 Hours of Great Glen

August 12-13

Pinkham Notch, New Hampshire

(www.24hoursofgreatglen.com)

Lansing Legislator

1/2 Iron Distance Triathlon

August 13 - Lansing, MI

(www.3disciplines.com)

Midnight Rush Adventure Race

August 18-20 - Clayton, GA

(midnightrush.trailblazerar.com)

Pike's Peak Ascent,

Pikes Peak Marathon

August 19, 20 - Manitou Springs, CO

(www.pikespeakmarathon.org)

Great Buckeye Challenge

August 20 - Waynesville, OH

(www.greatbuckeye.com)

The Endurance 100

August 26 - Park City, UT

(www.thee100.com)

Green Mountain Stage Race

Sept 1-4

Waitsfield, Fayston, Burlington, VT

(www.gmsr.info)

We're continually adding more events, so keep checking our website to see what races we're sponsoring.

The Importance of Post-Workout Refueling

Although I've written a full-length article about recovery in The Endurance Athlete's Guide to Success (which I very much recommend that you read), I want to take a moment to remind you just how important this particular component of your workout is, especially now that peak racing season

(see STEVE BORN on page 15)



(STEVE BORN from page 14)

is here. This advice is worth repeating: how well you perform tomorrow depends on how well you recover today. I adamantly believe that what you do in the 60 minutes following your workout is as important as anything that you do during your workout. This is the time when your body is primed to make the most out of all the hard work you've put into your training. If you give your body adequate nutritional support as soon as possible after your workouts, it will respond marvelously, storing increased amounts of muscle glycogen (so you'll have more ready-to-use fuel available), repairing lean muscle tissue (allowing it to become stronger), and supporting and enhancing the immune system (allowing you to increase your training volume without compromising your health).

The best race preparation, at least in terms of fueling, comes not in the few days preceding the race, but in the many weeks leading up to the race. Far too many athletes either forget about or neglect post-workout refueling, and then try to do the serious "carbo load" for one night or maybe a few days before their race. Of course, it's too late to influence glycogen stores at this point, and those carbo loading feed-a-thons end up doing nothing more but adding calories to a system that isn't equipped to handle them. Most of that pasta either passes through, or gets stored as fat, neither of which will enhance your performance. Look, if you want to do something that will really improve your race performance, make sure you put some fuel back into your body right away after all your workouts. This is a vital component of athletic success and it's so easy to take care of. Mix a scoop or two (or more, if you've had one of those "epic" workouts) of Recoverite in cold water and drink it down. Isn't that simple? You'll put the best possible finishing touch on your workout and ensure that you've moved in the right direction towards a better race performance.

Enjoy reading this issue of and have a great rest-of-the-summer!

Steve

(RITE AID from page 13)

Russ Langley - Russ is part of the heart and soul of this team. He's been with the team for five years, and prior to that Russ and I battled many relentless battles. Russ rides with his emotions and is a total fighter. He has no fear and is without doubt one of the tough men in the peloton. When he is in the race, he raises the bar for the boys on the team. He is the type of rider that makes the break and can ride just about any type of course. As Walton once said, "I would rather have a rider with a ton of heart and good abilities than a rider with tons of ability and no heart." Russ has a ton of heart and he's always got his brother's back.



Mike Beers - "Speedy" has been with the team for two years. He is a track specialist and is the 2005 Master World Champion in the pursuit. If you need someone to go to the front and go really fast, Speedy's the one to call. In addition, Speedy doubles as our team mechanic and is the best in the business. He has unbelievable mechanical engineering skills and equipment knowledge.

EN: In addition to utilizing high quality equipment along with an intelligent training plan, nutrition is obviously important. Which of the E-CAPS supplements and Hammer Nutrition fuels is the team currently using? Can you give us some feedback on how the team is using them and the effect they've had on the team?

Arch: Over the years that we've used E-CAPS and Hammer products, it's become more apparent to us that to reap the maximum benefit from the products, it's really best to use them on a daily basis. That means using Premium Insurance Caps and Race Caps daily, and Perpetuem/Sustained Energy/Endurolytes/Whey/Hammer Gels for training as well as racing.

Each rider uses his own variety of E-Caps products daily. By using the supplements not just on race day, but everyday in training and recovery days, it helps tremendously with recovery and also to enable our riders to dig

deeper in workouts, thus reaping maximum benefits. It's also important to train with the supplements, because every rider's metabolism and energy needs are different. Each rider responds differently, so he needs to fine-tune his supplements and fuels just as he fine-tunes his workouts. Just like you wouldn't race on a new bike you'd never ridden on, you shouldn't rely on the "trial and error method" in competition!

For races, we usually mix the Perpetuem a little lighter, like 1.5 scoops per large bottle. Some guys like it thicker, but we need to appease all the guys when they're getting bottles from the feed zone.

Jon: When feeding 6-8 riders in a stage race, the feeders have Perpetuem and HEED ready to hand out. If riders like to mix these a little differently, they simply make their start bottles. For example, I typically will add Endurolytes to my start bottles (Perpetuem). The feeders also have Hammer Gel and Hammer Bars on board ready to hand up. Quite often you'll see a single-serve gel with the top threaded into the top of the bottle. The riders can grab a bottle and get the gel they need in one hand-up. One other item that we added this year to our stage race supply is Recoverite. The feeders have a variety of Recoverite drinks, some mixed with water, and some mixed with soymilk, ready for the drinking. Did I mention how awesome our support is?

EN : You guys are great! Thanks for your time and good luck with the rest of your season.

Product Spotlight : Liquid Endurance

Steve Born

Of all the factors that can negatively affect the quality of our workouts and race performances, I'd suggest that hot weather - or, more appropriately said, the inability to deal with hot weather - is at or near the top of the list. Now that we're well into the hot weather season (and knowing that it's going to be with us for quite a while) it's the ideal time to incorporate Liquid Endurance into your supplement program. Here's why: In hot conditions, especially beyond a two-hour effort, your body's core temperature can increase dramatically. Your internal cooling system responds appropriately, producing copious sweat, but unlike your car's radiator, which recycles its coolant, your sweat evaporates and drips away, and it's gone. Obviously, re-hydration is your basic strategy, but a well-planned dosing of Liquid Endurance when a hot-weather race is on tap can help keep you within safe limits.

Unreplenished fluid loss causes endurance athletes several problems:

- Your heart must work harder in order to pump a decreased, but thickened, blood volume.
- Fluid depletion inside and outside muscle cells may slow down the metabolic reactions necessary for efficient muscle fuel transport.
- Inadequate fluids result in higher cell temperatures altering metabolic rates for less-than-optimal endurance performance.

At the very least, excess body fluid loss means premature fatigue and decreased performance. If the loss goes unchecked during extended exercise, the potential for dehydration and its serious consequences increases. Once you get into the dehydration range, you're cooked-literally and figuratively-collecting a DNF and possibly an IV, too. Liquid Endurance, along with prudent hydration, will address the two primary problems-fluid loss and fuel metabolism decline-that endurance athletes face when training or competing in hot conditions.

The Liquid Endurance Formula

Glycerol - Glycerol is a physiologically well-tolerated, naturally produced metabolite of fatty-acid oxidation. It absorbs rapidly when taken with water or sports drinks, increasing the water content in blood, cells, and extracellular spaces. All three of these compartments contribute to sweat volume, resulting in a significant increase in cooling efficiency during prolonged exercise. Glycerol is metabolized by the cells into a substance called dihydroxyacetone phosphate, which is a normal metabolite by-product found in the glucose-for-energy pathway. Glycerol also has an important role in the absorption of l-carnitine, detailed later.

Glycerol Mechanisms

Glycerol ingestion (GI) resulted in greater fluid retention than the ingestion of water alone (WI; 60 vs. 32% 3-h post hyperhydration). This improved fluid retention with GI resulted from lower urine flow rates (peak 6.2 vs. 10.5 ml/min) associated with lower free water clearance rates (peak = 1.2 vs. 8.2 ml/min). Hyperhydration had no effect on plasma atrial natriuretic peptide concentrations. Changes in plasma aldosterone were unrelated to differences in fluid retention. Antidiuretic hormone concentrations (ADH) were significantly reduced from pre-hyperhydration levels during both hyperhydration trials but tended to rise during GI compared with WI at the very time urine flow and free water clearance differences were also evident. This suggests that ADH may, in part, be responsible for glycerol's effectiveness, although differences in ADH concentrations were small and near the assay's sensitivity limits. Alternatively, glycerol's effectiveness may result from its directly increasing the kidneys' medullary concentration gradient, and hence, water reabsorption.

[REFERENCE SEE: J Appl Physiol 1995 Dec;79(6):2069-77.]

L-carnitine - L-carnitine is a vitamin-like nutrient essential for the utilization of fatty acids for fuel. One nutrition scientist writes, "Carnitine absolutely controls fat use because it forms the transport system that moves the fatty acid molecules into the mitochondria (furnaces) of the cell where they are burned for energy." Inadequate l-carnitine inhibits your body's ability to convert fats into fuels.

Unfortunately, the absorption of l-carnitine is poor, at between 15-20%, because the kidneys rapidly filter and remove 80-85% of the oral dose. Fortunately, glycerol reduces kidney filtration by redirecting fluids consumed into extracellular spaces. This allows the carnitine to circulate longer and therefore absorb better, so you get more of it to help convert fats to fuels.

The fats-to-fuel feature is especially important because during long, aerobic-paced endurance exercise, fatty acids fulfill the majority of energy requirements (in the first hour of aerobic exercise 30-35% of your energy comes from fat mobilized into the energy cycle. During the second hour the contribution of fat to energy is doubled). The ability to efficiently use fats for fuel cannot be underestimated, and being able to access those fatty acid stores will help extend precious muscle glycogen as well as body fluids. Glycogen metabolism releases a substantial amount of water. Increasing the efficiency of fatty-acid metabolism will both decrease water release and increase the amount of naturally produced glycerol. All of these factors help prolong endurance.

Pyridoxine HCL (Vitamin B-6) - Vitamin B-6, an active compound in over 60 enzyme systems, plays a major role in the metabolism of all fuels, including fatty acids. Additionally, without sufficient supplies of vitamin





B-6, the body cannot make l-carnitine and therefore it cannot access fatty acids efficiently, thus depleting the amount of glycerol produced.

Dr. Bill Misner writes, "A deficiency [of vitamin B-6] created during prolonged exercise may directly translate into poor utilization of glycogen, amino acids, and fatty acids for producing continuous muscular energy. A trace amount of pyridoxine HCL keeps the energy pump primed with all the substrates and fuels needed for a prolonged endurance event."

Chromium polynicotinate - Chromium plays an essential role in energy production and the synthesis of glucose, fatty acids, and amino acids. However, this trace mineral is rapidly depleted via perspiration, urination, and extreme temperatures, which is why we've included it (in the highly bioavailable polynicotinate form) in Liquid Endurance.

Liquid Endurance Dosing Protocols

Our general recommendations are to use one tablespoon of Liquid Endurance per 100 lbs body weight, mixed in 24 fluid ounces water. Drink this at three-hour intervals four times daily for three consecutive days prior to a hot-weather event.

A more precise loading dose, based on body weight:

WEIGHT	AMOUNT OF LE
100 lbs	1 TBSP
110 lbs	1 TBSP + 1/4 TSP
120 lbs	1 TBSP + 1/2 TSP
130 lbs	1 TBSP + 3/4 TSP
140 lbs	1 TBSP + 1-1/4 TSP
150 lbs	1 TBSP + 1-1/2 TSP
160 lbs	1 TBSP + 1-3/4 TSP
170 lbs	1 TBSP + 2 1/4 TSP
180 lbs	1 TBSP + 2 1/2 TSP
190 lbs	1 TBSP + 2 3/4 TSP
200 lbs	2 TBSP

Again, you'd use this amount of Liquid Endurance in 24 ounces of water, sipped slowly. Drink a bottle four times daily (approximately every three hours) for three days prior to the event.

NOTE: It is VERY IMPORTANT to

weigh yourself each day. If you gain 3% of your body weight before the three-day loading is finished, stop loading. Beyond 3%, body extracellular water-weight gain will inhibit, not enhance, performance. Most people gain 1-2%, which is ideal.

Some of the Science Behind Liquid Endurance

Subjects performed moderate exercise (equivalent to 60% VO₂max in a comfortable environment) in a hot dry environment. The exercise started 2.5 hrs after the fluids were ingested. The urine volume prior to exercise was decreased when glycerol was ingested, thus resulting in glycerol-induced hyper-hydration. During the exercise following the glycerol-induced hyper-hydration, there was elevated sweat rate and lower rectal temperature during the moderate exercise in the heat. There were no changes in hemoglobin, hematocrit, or serum electrolyte concentrations following glycerol intake. These data support the hypothesis that glycerol-induced hyper-hydration reduces the thermal burden of moderate exercise in the heat.

[REFERENCE SEE: Med Sci Sports Exerc 1990 Aug;22(4):477-83.]

Eight competitive cyclists [mean peak oxygen consumption, (VO₂(peak)) = 65 ml x min⁻¹ x kg⁻¹] undertook two 60-min cycle ergometer time trials at 32 degrees C and 60% relative humidity. The time trials were split into two 30-min phases: a fixed-workload phase and a variable-workload phase. Each trial was preceded by ingestion of either a glycerol solution [1 g x kg⁻¹ body mass (BM) in a diluted carbohydrate (CHO)-electrolyte drink] or a placebo of equal volume (the diluted CHO-electrolyte drink). The total fluid intake in each trial was 22 ml x kg⁻¹ BM. A repeated-measures, double blind, cross-over design with respect to glycerol was employed. Glycerol ingestion expanded body water by approximately 600 ml over the placebo treatment. Glycerol treatment significantly increased performance by 5% compared with the placebo group, as assessed by total work in the variable-workload phase. There were no significant differences in rectal temper-

ature, sweat rate, or cardiac frequency between trials. Data indicate that the glycerol-induced performance increase did not result from plasma volume expansion and subsequently lower core temperature or lower cardiac frequencies at a given power output as previously proposed. However, during the glycerol trial, subjects maintained a higher power output without increased perception of effort or thermal strain.

REFERENCE SEE: [Eur J Appl Physiol Occup Physiol 1999 Oct;80(5):494-501.] FROM J.O.E.[THE JOURNAL OF ENDURANCE:2001:#[10]

Summary

With Liquid Endurance, you get so much more than a "heat tolerance" product. You'll appreciate its benefits any time, but especially during hot weather races, when your cooling system is pushed to its limits.

Storage Suggestions : Keep your product fresh

Heat, moisture, light, and circulating air properties from the environment initiate microbial deterioration potency loss in supplements and fuels. A few years ago I (Dr. Bill) measured room air versus refrigerator humidity. Inside the refrigerator the humidity was usually 30-60% less than the room humidity.

I read that 17% is the average conventional fridge humidity, though it may vary by unit and area. Keeping supplements, powder/gel fuels in low temperature & humidity (in the fridge) is the best environment for preserving product integrity. However, all E-CAPS supplements and Hammer Nutrition fuels generate a 1-year up to 2-years shelf life potency left unopened. Once they are opened, they are exposed to natural air born microbes and a token influx of humidity. Add to that summer's heat increase, the reactions leading to deterioration also increase reducing shelf life potency to 40-50% time of the unopened product. Under 40F in the fridge is ideal, when a product is opened and not finished within 3-6 months.

The Training Express : The latest on lactate

Jonathan Siegel, CSCS

Knowing power and heart rate levels at lactate threshold may help you train and race effectively, and knowing how the body uses lactate may be an incentive to train with a bit more intention.

Pedaling into the wind at the ACA state time trial, my legs were starting to feel that slow burn. I looked down at my power meter and I was over my lactate threshold. I backed it off 10 watts, and within a minute the burning disappeared and my speed increased. I mentally took note to pace a bit more conservatively, and continued on. Later in the time trial, as I began to suffer a bit more, I kept it dialed to the wattage I knew I could produce and hold, and tried to ignore the fatigue creeping into various parts of my body.

Lactate is produced in our muscles at low exercise intensities, and at much higher ones. In fact, it's present in the body at rest. Lactate is created during the breakdown of glucose (glycolysis) which is one chemical process that helps our body create energy. Pyruvic acid is produced through this process, and as it accumulates, it is converted to lactate. Under moderate-to-high exercise intensities (tempo, for instance) lactate is converted back to pyruvic acid and re-used for energy production.

In terms of improving the use and re-use of lactate in our muscles, lactate threshold (LT) intervals encourage fast-twitch muscles to produce an enzyme (MCT-1) which is important to transport lactate into muscle cells where it is converted into pyruvic acid for further exercise. The more MCT-1 you have, the greater the rate of lactate conversion and the greater the muscle endurance. LT intervals also increase the number of mitochondria (cellular energy power plants) and capillaries (blood highways).

Despite their benefits, LT intervals have earned a bad reputation due to the discomfort associated with the efforts that are required to produce more energy. Actually, lactate doesn't cause the discomfort. If it did, my fin-

gers would be in pain from typing (one might say I type at a "painfully" slow rate, but I digress...). Lactic acid is formed from pyruvic acid as a result of insufficient oxygen at the muscle cells during high rates of exercise. It then converts back into lactate once in the blood stream, in the presence of more oxygen. Once the lactic acid is converted back to lactate, the lactate in turn is converted and re-used as pyruvic acid. Lactic acid, however, may cause loss of muscle power and pain in the working muscles if it builds-up past the point that the muscles can clear it into the blood stream for conversion back to Lactate. The latest (but unproven) theory on this is that the changed pH from accumulated and un-cleared lactic acid causes the discomfort and slows muscle contractions.

So, what about that NY Times (NYT) article that people have been calling and e-mailing about? On May 16th the NYT ran an article titled "Lactic Acid is not Muscles' Foe, it's Fuel". As I illustrated above, it's lactate that is the fuel, and lactic acid that is a by-product. Neither is a waste product, as we may have come to believe. Both are essential for producing the results that you want, both during exertion and for recovery. In fact, fifty-percent of the lactate produced during a moderate-to-high level workout is used for replenishing muscle glycogen stores during recovery. (In this case, I'm talking about lying on the couch eating chips, and I'm referring to recovery from higher intensity workouts). When lactate is released into the blood stream, the liver uses it to produce glucose and glycogen, which are then used by the working muscles.

What is the big deal about testing then? If lactate is a fuel then why care how much is in the bloodstream at any given time? The value of a test is to discover at what workload (watts and/or heart rate) your body is accumulating lactate to the extent that glycolysis is proceeding with less oxygen and muscle action becomes inhibited. By identifying this level, one can target training zones specifically to facilitate the muscle

adaptations (more MCT-1, mitochondria and capillaries) that are required to produce more energy at this level. LT testing doesn't predict performance, but if the LT test protocol includes a section where the rate of lactate clearing is determined, then one can also adjust training to maximize clearing as well as power production at higher levels.

The bottom line is that lactate is a product of carbohydrate metabolism during exercise, and is a valuable part of the body's energy production. Rather than dreading the "burn", know that your muscles are working hard to produce power, and that you are benefiting your recovery as well. One final note, as lactate is processed rather quickly, it doesn't cause that lingering soreness several days later. More on that in a future article...

Jonathan Siegel, CSCS is the director of coaching at JDS Sportcoaching, LLC. If you'd like to schedule a lactate test, or if you have a comment or a training question, you can email jonathan at : jds@jdsportcoaching.com

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Nate's Corner : Staying motivated



Sometimes life throws barriers up in our way that we run smack in to. We fall down and maybe at first we can pick ourselves right back up. But sometimes we can't or sometimes it seems like too much effort to even try. So, how do we stay motivated when things start going south?

Maybe the barrier is repeated or prolonged sickness that derails your training. Or maybe your job is taking up too much time and energy, so the last thing you feel like doing is training. Or maybe you're hit with an injury. Or maybe you're hitting some speed bumps in your personal life. Etc., etc., etc. . . How do we handle all of this?

First, don't let the wheels come off. While it might seem that all is lost, don't believe it for a second. It is not difficult to fall off the edge and into the abyss of depression about your waning fitness, your inability to train/race, and so on. We are used to pushing ourselves hard and training day in/day out. So, when this freedom is taken away from us, it's hard not to let it get us down. The best thing you can do here is focus on what you CAN do rather than what you can't do.

Let's say you're a cyclist, but an injury is keeping you from biking. You have a choice to make - and, believe me, you always have a choice. You can either: 1) do nothing since you cannot do your primary sport. This is what starts you

down the slippery slope of losing motivation, getting depressed, gaining weight - you name it; or 2) you can find a way to exercise to maintain your fitness or at least minimize the loss of fitness so that when you are back on the bike, you are ready to get back at it. This approach can leave you excited to finally get back on the bike. And, your day-to-day routine is minimally disrupted, so you won't feel like you're floating out in space. Instead of cycling, you can try swimming or water running or the StairMaster or the elliptical trainer or the rowing machine - whatever does not aggravate the injury further.

Doing something, even at a very baseline, recovery level of effort, is better than doing nothing. Any of the above examples are great ways to keep the heart pumping and your fitness growing. And, since you would be exercising in a way you are unaccustomed to, when you do get back to cycling you might find your fitness is actually better than before. The short rest from cycling and the use of your body in a completely different way can help to rejuvenate you and build you up in new ways, effectively making you stronger all-around.

This is just one simple example. As athletes, we are creatures of habit. We are used to juggling many responsibilities and being in certain places at certain times. Our training, work and family require this so that we can properly attend to each facet of our lives appropriately. So, when one of these facets falls out of whack, it can send our entire lives into tailspins...if we allow

that to happen. But we don't have to! We CAN stay in control.

And that's the crux of it all. As I stated earlier, we always have a choice to make. We are in charge of what we decide to do or not to do. So, if you end up gaining 10-20lbs while you are nursing an injury, you have to ask yourself whether it is because the injury completely took you out (like getting hit by a car while biking) or if you simply decided to wallow in the misery that can accompany a nagging injury (such as an achilles tendon strain or patellar tendonitis). In the former case, there is nothing you can do about your inactivity. Yes, you can fight to rehab ASAP, but the road to recovery is long. So, your motivation should be to get back in the saddle more quickly than any doctor tells you is possible. In the latter example, your blinders and lack of flexibility are what is keeping you from looking at alternatives to stay fit.

Hopefully this article had been insightful to you. Each one of us hits both expected and unexpected roadblocks along the road of Fitness Improvement. It is how we handle these roadblocks - emotionally, mentally, and physically - that will help shape the athletes we are and the athletes we are becoming.

Happy Training,
Nate Llerandi

Nate Llerandi is a former national champion class swimmer/world class triathlete. He has been coaching since 1990 and creates programs for athletes of all sports and ability levels. You can contact him at natellerandi@yahoo.com

Website Update : We've changed our address

Although you won't see any major graphical changes in the next three months, you will certainly begin to notice that we are migrating away from E-CAPS and embracing Hammer Nutrition as the parent company and core branding for our products and services. Since we all have some difficulty typing "nutrition" from time to time, we've elected to adopt **www.hammernut.com** as our primary web site URL.

Please update your bookmarks accordingly. Even our email addresses will be updated to reflect the changes. Don't worry, though, we aren't going to simply abandon E-CAPS. Our plan is to migrate everything over to Hammer Nutrition slowly, one step at a time, and we hope to be fully cleansed of E-CAPS (and www.e-caps.com) by the summer of 2007. Stay tuned for more updates and announcements regarding these changes.



ENDURANCE FUELS
www.hammernut.com

CoQ10 : More benefits attributed to this 'wonder' nutrient

Steve Born

Since 1987, long before Coenzyme Q10 (a.k.a. CoQ10) became the well-known nutrient that it is today, athletes had access to this amazing nutrient via the E-CAPS supplement Race Caps (now Race Caps Supreme). CoQ10 is a fat-soluble nutrient found in every cell of the human body, and it plays an important role in the energy production process known as the mitochondrial electron transport chain. In addition, CoQ10 is a powerful antioxidant, helping to protect the body by neutralizing specific free radicals. These are the two primary reasons why you'll find CoQ10 in Race Caps Supreme:

- It prolongs endurance by supporting the optimal conversion of your food and oxygen consumption into energy
- It enhances recovery by neutralizing fat-soluble free radicals, which supports the immune system and minimizes muscle soreness

CoQ10's benefits certainly don't stop

at athletic performance, however, and its known general health benefits are many, which is why Race Caps Supreme is considered a "Daily Essential" supplement. For example, science has shown that CoQ10 is a superb "heart health" nutrient (CoQ10 can increase energy production in the cells of the heart muscle, it helps to normalize high blood pressure, and may aid heart-specific conditions such as angina, arrhythmia, and others) [1, 2], it helps guard against periodontal disease [1, 2], it aids in preserving healthy vision [3, 4], it helps prevent migraine headaches [5, 6], and it helps slow the progression of Parkinson's disease [7, 8].

Research continues to reveal even more benefits for CoQ10. Italian research in early 2006 suggests that CoQ10 may play a role in helping to prevent skin cancer [9]. CoQ10 has shown promise as a powerful aid in the prevention of prostate cancer [10] and breast cancer [1]. In two studies, CoQ10

was shown to support healthy blood sugar levels in diabetics [11, 12]. And one of the most exciting new studies suggests that CoQ10 may aid in the prevention of a primary culprit of heart disease, a condition known as endothelial dysfunction, which is described as inability of the blood vessels and arteries to dilate fully in response to increased blood flow demand [13].

With the number of benefits of CoQ10 being uncovered on an ever-increasing basis, chances are there will be even more to talk about shortly after this issue of **Endurance News** is published! Needless to say, CoQ10 is a vital nutrient - both for athletic performance and even more so for a variety of general health issues - and taking Race Caps Supreme daily, all year round, is certainly a strategy we think you'll agree is very wise indeed.

References [1-13]
Available upon request

Tieni Duro : Junior Development Team

Steve Born

Throughout the years we have supported the sport of road cycling via our sponsorships - both athlete/team and events - and that support has increased annually. One of the teams we've supported the longest is Tieni Duro (Italian phrase meaning "stick to your guns," "hang in there," or similar), a junior development team based in Lafayette, California.

As mentioned on their web site, Tieni Duro "is a non-profit organization focused on developing young cyclists into capable, safe, competitive racers. Our mission is to create an environment where boys and girls reach to achieve their personal best through cycling and competitive sportsmanship. Tieni Duro is a Junior ONLY program. As the cyclist turns 19, it is time to move on to a different team to continue their growth. Some riders will go on to ride for their collegiate team, while some will look for placement on a U23 Development team. Tieni Duro is constantly keeping in touch with various Pro and Development teams. For those that are capable of moving up to race competitively at the U23 level, we will provide recommendations to the various U23 Development teams."

Currently, there are 17 cyclists on the Club team and 7 cyclists on the Elite team.

We recently received a team update from Jason Kent, the Director Sportif of Tieni Duro...



As the top Junior Development Team in California, Tieni Duro continues its assault on the racing scene while preparing to take on the best in the country at the Worlds Qualifiers at Longsjo in Fitchburg, MA, as well as Nationals in Seven Springs, PA in the coming weeks. Immediately following that, we will have at least one rider (confirmed), and possibly two more, attending the

Tour de l'Abitibi, as part of USAC composite teams.

The Tieni Duro Juniors have been taking California by storm in 2006, earning the top spot on the podium almost every weekend since 1/28/06. It is with great anticipation and excitement that we prepare to take on the best in the country at Fitchburg and Seven Springs in the coming weeks. Top highlights so far include:

- 1st - 17/18 at McLane Pacific Crit (NRC Race)
- 1st - 13/14 at the CVC Crit and Circuit race - winning the Omnium
- 1st - 17/18 at the Sea Otter Road Race
- 4th - P/1/2 in Stage 4 (Road Race) of the Madera Stage Race.
- 1st - NCNCA Junior Points Series in 17/18.
- 1st - NCNCA Junior District TT Championship

Hammer Nutrition congratulates the Tieni Duro squad on their great race results and wishes all the riders continued success in 2006!

4,364 Miles : Fast friends at the 2005 Highline

Brian Frank

Brian's note:

A funny thing, or two, happened during the Highline Hammer ride last August. Since a back injury prevented me from riding the 136 mile loop, I volunteered to drive the broom wagon (the last vehicle on the road responsible for making sure that no riders get left behind) with my Mom riding shotgun.

After a brief stop in St. Mary's, 50 miles in, for more water and calories, we sent the last of the riders out towards the lunch stop in East Glacier. Mom and I decided to stop at the Park Café for a bison burger and a piece of home made pie before resuming the sweeping duties. As we were leaving the café, a large bicycle tour group was pulling in and several riders commented on the Hammer van, saying that they loved our

peratures in the country in the winter, but on this day it was almost 90) we encountered four cyclists who were obviously riding cross country and looked like they could use some help. They were in the process of changing a tire, and eating lunch. Still having time to kill, I decided to stop and visit with them for a few minutes.

I pulled the van over and noticed that they all seemed a little dazed and confused. A lot of bicycle tour company vans follow this route, but they don't stop to offer help unless you're on their tour. Perhaps that was the reason for the look. I greeted them and they told me that they were heading East to West across the country and so were about two thirds of the way into their journey.

When they told me that they had been living on pb&j's and sports drinks for over a month, I cringed at the thought. Their look changed from dazed to sheer disbelief when I told them that I had a van full of cold water, energy drinks and electrolytes and they were welcome to help themselves. At first they just wanted water, but after a bit of explaining, they were game for everything.

So, I loaded them up with as much Endurolytes, HEED and Perpetuem as they could carry and bid them farewell. We left them with the satisfaction of helping out four strangers on an epic



journey. It also made a good story for the barbeque that evening.

Months passed and I'd forgotten about the encounter until this May when we received this nice letter and these pics from our Cut Bank friends.

Now, here's the rest of the story.....

Dear Brian,

We made it! After 72 days, 4,364 miles, and a few saddle sores we arrived at our final destination in Rialto Beach, WA. The trip was absolutely amazing, one I am sure we will never forget. The energy fuels you gave us were awesome and they came at a perfect time in our trip. From Glacier on we found ourselves on big climbs, climaxing at a 7,500 ft day on Route 99 in British Columbia. The HEED was by far our favorite drink, and the Endurolytes and the Perpetuem were exactly what we needed on the big days. We all noticed differences in energy levels and recovery times of our muscles. Thanks so much for your generosity and kindness. It was much appreciated!

Sincerely,
Colin, Eric, Adam and Adam



products and asked the almost rhetorical question if we worked for Hammer. Then one of the riders from Texas explained that they had tried to stock up on Endurolytes for this tour, but their local shop had been out and asked if we might have some. Of course we did and gave them some with our compliments. They were stoked and we enjoyed being the Endurolytes fairies.

Ok, back to the main story. About 15 miles out of St. Mary's, just before Cut Bank creek (that's the town in Montana that regularly records the coldest tem-

We've moved to www.hammernut.com

Race Report

Checking in with some Hammer athletes

Getting His Kicks On Route 66 : Scott Springer

Dear Hammer Nutrition,

On April 16th, 2006 I set out on the longest bike ride of my life; the 80th anniversary of Route 66. We began in Santa Monica, CA and rode over 2500 miles of old road, which we expected, to Chicago, IL. The longest ride I had done before this was 800 miles in one week so this was a big undertaking for me. The day after day of 40+mph winds we experienced was more than I could imagine but PAC Tour, which has done a number of crossings of America, knows what it takes to pull off a ride like this and they did.

To keep up a pace of 90-125 miles a day for

a month was a big undertaking even with ideal conditions. PAC Tour had an abundance of Sustained Energy and Perpetuem for us each day and in the evenings we had Recoverite along with Endurolytes.

I began using the products religiously from day one. The first week I expected to be fresh and ready for the task. It went well. The second week I was strong and was able to be positive even with the wind conditions each day. The third week, with rain thrown in along with the wonderful headwind, was a challenge but we made it. The last week we began to fatigue and become burdened with the rain and stormy conditions but on May 14th we pulled in to our final destination - Chicago.

I feel I was able to do the 8-10 hours a day for 29 days because of the Hammer products. They were the

means for me to get up every morning and hit the road even when the elements were overwhelming. Having one element to face, like rough roads, headwinds, rain or mountains to climb is tough, but when they're thrown at you simultaneously it's mind boggling. We were able to keep going not just because of the months of training that we had done or the bike equipment or the meals we ate. I honestly believe we got through the the last 2 weeks because of your products. When I use your products I am able to keep a mind set and strength to endure the next hill or mountain, the rain or road condition. I have a positive feeling about my experience because of your help. I feel it pulled me over the edge when I was almost to the end of my road. I believe in Hammer products.

Scott Springer

USA Triathlon Age Group Nationals : Way to go!

USA Triathlon Age Group Nationals
Smithville, Missouri, July 8, 2006
S 1.5k/ B 40k/ R 10k

We'd like to congratulate the following Hammer Nutrition athletes for their outstanding podium results...great job!

Scott Myers - 3rd place
Men's 30-34 - 2:01:30
Donny Forsyth - 2nd place
Men's 40-44 - 2:06:06
Kyle Welch - 1st place
Men's 45-49 - 2:07:06
Jay Marshall - 2nd place
Men's 45-49 - 2:07:23
Tim Kerr - 2nd place
Men's 55-59 - 2:20:41
Jon Adamson - 3rd place
Men's 65-69 - 2:38:56
Stacey Richardson - 3rd place
Women's 30-34 - 2:15:23
Pippa Michaels - 2nd place
Women's 45-49 - 2:24:19
Laura Sophiea - 1st place
Women's 50-54 - 2:20:59
Trish Kimper - 1st place
Women's 60-64 - 2:50:37

50 months, 50 states, 50 marathons : Cheryl Hart

Just wanted to report that I had a great marathon at Grandfather Mountain in NC over the weekend. It turned out to be a 27 mile marathon as they had to reroute us due to construction on the Blue Ridge Parkway. I finished 4th Woman Overall and 1st Master and won my age group. I spread the word about why an old lady can take on the endless string of hills and not grow weary. I really felt great and did it on only one 20 miler. Sustained Energy, Race Caps Supreme and Hammer Gel. I actually regretted at Mile 21 that the run would be over in six more miles....! I am doing a marathon every month on my quest to run one in all 50 states. Will keep wearing the Hammer inside and out!

Thanks again for all your support.
Cheryl Hart





A Real Warrior Randy Profeta

Just a quick report on last weekend's 24 Hours of Orange County mountain bike race...

This was the inaugural race for the Warriors' Society in southern California and was held in the Santa Ana Mountains, right in my backyard. The course was 5.6 miles of mainly single-track with about 1,300 feet of elevation gain per lap. I rode solo in the 46-and-over Expert class.

Race day was sunny and hot, with the emphasis on "hot". Daytime temperatures broke 100 degrees in the canyons and passes. We did not get much of a break in the evening as temperatures barely dipped below 80.

I fueled with a SE, Hammer Gel and HEED combination, supplementing with 2-4 Endurolytes per lap and 1-2 Anti-Fatigue Caps. I never had any issues with cramps, although I had to come off the bike at about 2:30 AM because I was losing my appetite and was having a difficult time swallowing anything. I rested for about 2 hours, sipping HEED and slowly taking in some SE paste mixed with Tropical and Raspberry until my energy came back up.

The heat came back with a vengeance on Sunday morning. Quite a few of the riders were cramping. I never came close to cramping and continued to make forward progress.

End result - first place in my class and a top-10 GC finish with 12 laps. Thanks to Hammer Gel and E-CAPS for getting me on the top box again!

Randy Profeta

Texas Water Safari William Russell & Andrew B. Stephens

Thank you a million for supporting us during the Texas Water Safari, "The World's Toughest Canoe Race". This year was perhaps, historically one of the most difficult Safaris yet, the water was almost the lowest it has ever been and as a result everyone's times increased dramatically. The heat was blazing and competitors were dropping out of the race constantly.

Your Hammer products truly are the best for events such as this one. I stomached everything pretty well. The only problems that I faced were extreme back pain, a butt that I could hardly sit on, and a sunburn that made me feel like I was melting. I was able to overcome these pains and various other problems because your Hammer products made me feel strong throughout the race.

We took 3rd place Tandem Unlimited, which is the most competitive two man division in the race. Our competition was stiff, one team broke their boat and several others dropped out. We got tons of pictures of us sporting our Hammer gear and some were taken professionally that can be found on the internet. Many people asked us about Hammer Nutrition along the way and we were proud to tell them about our sponsorship and all of the great products that you have to offer.

Thank you very much for your generosity and support. - William Russell



The Unbeatable Molly Hayes

Bridger Ski Foundation Duathlon
Bozeman, Montana
5K Run / 20K Bike / 5K Run
1st 70-79 in 2:03

Way to go Molly!!!!

Fueling Success Jason Willis

First, I want to thank Brian on this list because he recommended the fueling strategy that I modified briefly and crushed the field. This was my experience:

- 300 calories of Perpetuem for pre-race meal
- 3 Endurolytes 45 min before race
- 1 Hammer Gel 10 min. before race
- 2 scoops HEED with 32oz water for use on paddle and bike
- 24 oz water for hydration on hike bike
- Endurolytes throughout race.

This is was a short sprint in which I finished 6th male out of 45 teams and 9th overall out of 90 teams. This is the best I've done in a sprint race and I owe a lot of my success in this race to this forum (The Endurance List) and Hammer's products. Without the Endurolytes I would have DNF'd due to electrolyte loss. Without the HEED I probably would have been drinking Gatorade and bonked 'cause of the sugar. Because of the Hammer products I was able to stay at 180 BPM for 2 hrs at max effort!!

Thanks - Jason Willis

Coast to Coast Winners Team SOLE

Congratulations to Team SOLE (headed by Paul Lundgren, Karen Romero) on their victory in the grueling Michigan Coast to Coast Adventure Race. The race began on June 3rd in Frankfort, Michigan and, after 62 hours, 9 minutes, they reached the finish line in Alpena, Michigan. Team SOLE battled the entire way with Team Eastern Mountain Sports but prevailed in the end, finishing slightly over three hours ahead. An email that Paul sent out (subject line simply read: "SOLE WINS") highlighted the difficulty of the effort: "500km. June 2006. Cold, hot, swamps, sinkholes, bush, mosquitoes. Michigan holds a special place in my heart now (not)."

Congratulations to Team WeCeFAR/E-CAPS Florida who finished in an outstanding 5th place!

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- ...and so much more!!!!

The Back Page

Unusual For Her Age Group : Laura Sophiea

Here's an email we recently received from USA Triathlon Age Group National Championships Women's 50-54 champion, Laura Sophiea...

Hi Steve,

I wanted to take a minute and let you know how I did this past Saturday at USAT National Triathlon Championships in Kansas City, MO, and to let you know how I fueled for the Olympic distance event.

I won my age group and am the National Champion for the 50-54 age group, winning by 3 1/2 minutes. I actually finished as the 19th woman overall which they mentioned at the awards was unusual for that age group! I guess getting older has it perks!

For the race I used a Hammer Gel 30 minutes before the swim. During the bike I drank water and one 24 oz. bottle

of HEED. That is the first Olympic distance race I have done that for and it worked beautifully! I also had 2 Endurolytes mixed into my water bottle. I then took another Hammer Gel at 22 miles on the bike, which set me up well for the run! They had Hammer Gel on the run course as well. Then the recovery drink (Recoverite) at the end...!

I just wanted to thank you again for your sponsorship and I truly believe your products have helped me to a new level this year. I never really think of myself as an Olympic distance athlete, more of an Ironman athlete, but with your products that I am using this year I am an Olympic distance athlete!!!

I am beginning to start my long training for Hawaii and know that I will be using many more products.

Sincerely,
Laura Sophiea

Get your greens

Essential vegetable nutrition



\$24.95

90 capsules