

ENDURANCE NEWS

A NEWSLETTER FOR ENDURANCE ATHLETES

ISSUE #31

ELECTROLYTE REPLACEMENT

by Steve Born

The final ingredient for proper fueling during exercise has to resolve the electrolyte issue. Electrolyte replacement during exercise is a necessary procedure that is also highly individual. This is because everyone's body is different, their sport is different, training duration and intensities are different, and weather conditions are different.

WHAT ARE ELECTROLYTES AND WHY DO I NEED THEM?

Electrolytes are chemical substances used in the formations of electrically charged particles (ions) in body fluids. Electrolytes are used to create electrical energy necessary for many body functions including transmission of nerve impulses and muscle contractions. In simple terms, many normal bodily functions are dependent on these substances. As important as the fuel you consume and the water you drink during exercise is a consistent replenishment of electrolytes. Normal body functions, not to mention performance, are severely compromised if adequate levels of electrolytes are not present, especially in the heat and/or when exercise goes beyond the two-hour mark.

WHY CAN'T I JUST USE SALT TABLETS?

Many athletes have suffered needlessly with swollen hands and feet from water retention due to ingestion of salt tablets or electrolyte products which are too high in sodium during prolonged exercise in the heat. Too much sodium is counterproductive, as it interferes with or neutralizes the complex body mechanics involved in recirculating and monitoring proper blood sodium levels. Sweat generates large losses in sodium and chlo-

ride, which are recirculated by a positive feedback loop monitored closely through hormonal receptors throughout the body. In other words, the body has very effective mechanisms to regulate and recirculate sodium. Rapid replacement of sodium neutralizes the body's hormonal defenses, allowing water replenishing to dilute sodium content. High sodium electrolyte supplement is temporal and contradictory to natural physiological serum electrolyte control. One reason salt tablets were eliminated from professional athletic training kits is that shortly after a sodium-depleted athlete would slug a few salt tablets; stomach cramps would bend them over double.

Salt stains on jerseys and shorts are NOT an indication that the athlete is sodium depleted. Rather it is the body excreting excess amounts due to an overabundance in the body (which is why dumping more sodium in the system is extremely counterproductive). What is required is a low-sodium approach to electrolyte replacement that emphasizes a balance of essential minerals that cooperatively enhance the body's natural hormone and enzyme mechanics. In essence, we want to work with our body, not against it.

The truth is that 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 consumes approximately 6000 to 7000 mg per day. The average athlete stores at least 8,000 mg of dietary sodium in tissues and has these stores available dur-

ing exercise. Most athletes perform successfully using from 80-300 mg. sodium per hour in prolonged endurance events. Sodium is necessary but not by itself and not in mega-dose quantities.

WHAT MAKES ENDUROLITES DIFFERENT? AREN'T ALL PRODUCTS SIMILAR?

It would have been easy to formulate a product that matched one of the many perspiration analysis studies, then explain to athletes that they were simply replacing what they lost. Some products may do just that. Unfortunately, there's a problem with this because individual sweat-loss differences vary greatly and the human body does not and cannot efficiently replace what it spends during exercise activity at any intensity above walking pace. Electrolytes lost are not replaced by electrolytes consumed.

The body replaces only between 35-45% of what it loses during exercise. If we try to replace all the fluids at once, we end up with dilutional hyponatremia (overly diluted blood sodium levels) or water-intoxication. If we attempt to replace all the fuels that we spend, the stomach will back up in total rebellion, and refueling will come to a grinding halt. And, if we try to replace all the electrolytes we lose in equal amounts, a number of hormonal triggers may create all sorts of problems such as gastric stress, edema, or muscle spasm and cramping. If you want to see your effort come to a complete halt, forget to take in electrolytes or take in too many electrolytes from an unbalanced formula and watch it happen! Dr.

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A PERSONAL NOTE FROM BRIAN FRANK

Growth is generally a good thing, however it can be difficult to deal with just the same. So far in 2001, growth and the challenges it presents have been my main focus. Hiring and training additional staff, adding hardware and forecasting inventory have been next to impossible and have caused a few of our popular products to be backordered for up to a week or more.

We started the year by doubling our sales in each of the months of January and February, compared to the same months last year and then in April, we surpassed our all time record for orders processed in one month by over 10%. This was immediately followed in May with another 20% increase compared to April. Also, keep in mind that June, July and August are our busiest months, so we probably haven't seen the last of new sales records.

Honestly, I am not telling you this to be boastful or proud. I want to share this information with you for three reasons. First, I'd like to apologize to you if you have been inconvenienced or have experienced anything less than A-1 service recently. Second, to ask for your patience as we strive to maintain inventory of key products like Hammer Gel and Sustained Energy and to ask that you place your orders well in advance of your "drop dead" delivery date to avoid any frustration or inconveniences on your part. We are still doing a pretty good job of getting all of the orders received by 2PM MT. Time out the same day, but back logs and inventory shortage delays have been a reality. Placing your orders more in advance of when you actually need them would be very helpful.

The third reason is to assure you that this company is going strong and in no danger of imploding like so many of the "dot.bombs" have lately. Since the beginning, I have always believed in incremental, sustainable growth and avoiding debt whenever possible. Some would say that this has held us back, but I feel that it has guaranteed our viability over the years as markets have changed and other factors have required the flexibility to "roll with the punches" so to speak.

As always, I wish you health and athletic success for the year 2001 and beyond. We are doing everything we can to help ensure that you do. ■

Regards,
Brian Frank
Co-Founder

PRODUCT REFERRAL PROGRAM UPDATE

The original referral program idea remains the same:

1. Share your positive E-CAPS/ Hammer Nutrition experience with anyone who has not ordered from us before.
2. Give them your customer number or one of our special referral cards (jot down your name and customer number on it and hand them out to your friends). We'll be happy to give you more with your next order, just ask!
3. They order anything and tell us you referred him or her.
4. That's it. You earn credit with us and the person you referred earns 15% off their first order!

The referral points rewards have been changed. We keep track of your referrals in points. For every new customer you refer to us, you earn one point for every dollar they spend on their first order. Redeem points as credit:

- Four (4) points equal one dollar in credit with us!
- Eight (8) points equal one dollar in credit for any soft-good product.
- Points may NOT be redeemed for shipping costs.

Details that remain unchanged:

1. WE KEEP TRACK OF ALL POINTS. No accounting necessary on your part.
2. Newly referred customer must mention your name and/or customer number at time of ordering.
3. Newly referred customer must have never ordered anything from E-CAPS/ Hammer Nutrition before.
4. Points never expire as long as you order from us at least once every six months.
5. We reserve the right to end this program at any time without notice.

So spread the good word about E-CAPS supplements and Hammer Nutrition fuels and earn points towards any of our products! ■



FREE SHIPPING CLARIFICATION

Hopefully, you are all aware of our new program offering free shipping on all orders over \$200. However, for those of you living outside the continental United States, there is a catch. Since shipping charges to Alaska, Hawaii, US Protectorates and foreign countries can easily be over \$50 when the packages include heavy items such as Hammer Gel and Sustained Energy, we can only cover up to \$10.00 of the shipping charge.

Also, remember that free shipping within the continental US for orders over \$200 only covers

"cheapest way" shipping. If you need expedited service to guarantee delivery in 1, 2 or 3 days, we will deduct the "cheapest way" amount and only charge you the difference. For example, if the "cheapest way" shipping charge for a given order is \$7, but 3-day air is \$12, we would charge you the \$5 difference to send it via 3-day service.

So, the next time you are going to place an order, tally it up and if you are close to \$200, think about adding an item or two and it could save you a bundle in shipping charges. ■



RACE RESULTS

Congratulations to the following E-CAPS/Hammer Nutrition athletes:

Philip Farber placed 3rd in the Men's 50-55 age group at Calvin's Challenge on May 5th in Springfield, Ohio. This is a 12-Hour Cycling Time Trial. Philip rode an excellent 206 miles in this very competitive division.

Ageless Bill Riley continues to impress! His 3:10:56 time (wow!) in the Boston Marathon gave him a 3rd place finish in his age group (60-64).

Julie Kaplan defended her title (I don't think she's ever going to relinquish it!) as state time trial champion (women 45-49) on May 12th in Lancaster, CA.

Competing in the 1/2 ironman distance of the Gulf Coast Triathlon in Panama City, FL on May 12th, Adrian Treon grabbed a top ten finish (8th place) in the 50-54 age group with a time of 5 hours 10 minutes.

Melanie Mociun has sure been busy! Check this out. First came a win (both men's and women's 45-49 division!) in the Buffalo Run 1/2 Marathon (Catalina Island) on February 3rd. Her time was 1:55:14. Next was a 3rd place finish (45:25) in her age group at Nicki's Rainbow 10k, followed by a 3:47:19 Boston Marathon time. Less than two weeks later, she finished 1st in her age group, 2nd overall at the Ocean Beach Low Tide 10k in 48:06. Whew!

Cassie Lowe has been tearing up the California Triple Crown rides/races (a series of 200-215

milers) in preparation to defend her title in this year's Race Across America (RAAM). She tied for 1st in the Solvang Double on March 31st in 9:49. She finished 1st woman, 5th overall (new course record) in the very difficult Devil Mountain Double on April 21st in a time of 13:07. On May 12th she recorded her third 1st place finish, (this time 1st overall!) in the Central Coast Double in a new course record time of 11:16.

Shonny VanLandingham's season is starting off with a bang! On June 1st and 2nd she finished in 5th place in the pro cross country race and 4th in the pro short track race at the NORBA mountain bike event in Big Bear, CA.

In May, Roland Green of the TREK/VW professional mountain biking team (and avid Race Caps/Enduro Caps user!) recorded a win at the UCI World Cup mountain bike in Belgium.

Andrew Otto recently (June 2nd) recorded a rock solid 2nd place finish in the mountainous, 503-mile Race Across Oregon ultra marathon cycling race. His time was 36 hours, 34 minutes.

Arvid Loewen was another top Race Across Oregon finisher with a 5th place finish in the men's solo division in a time of 42 hours, 25 minutes, 12 seconds.

Last, but certainly not least, Terri Gooch won the women's division of the Race Across Oregon and finished a superb 3rd place overall in a time of 37 hours, 42 minutes, 42 seconds.

Congratulations to these athletes, all the finishers of the recent Ironman California and to all of you using E-CAPS/HAMMER NUTRITION products in your competitions!

We do try to recognize as many athletes as possible in the limited space available (there are just so darn many of you studs and studettes!). If interested, please email me your results at steve@e-caps.com and I'll try to get them in an upcoming newsletter. ■

WinSportingGoods.com

Athletes, are you looking to win some free E-Caps and Hammer Nutrition products? That's right, win FREE products each month; over \$125 worth! In fact, are you looking to win all kinds of nutritional supplies and sporting goods in general? We have just the place for you!



We are very happy to announce our new affiliation with WinSportingGoods.com, the leader in free sporting goods contests, sweepstakes, and giveaways. They have over 300 contests and sweepstakes each day, in over 60 different product categories, including nutrition, triathlon, running, cycling, fishing, hunting, soccer, and more. If you've ever wanted to win a ton of great products (including cash prizes and gift certificates, WinSportingGoods.com is the place to do it. They even offer a \$1,000 per month sporting goods shopping spree at your favorite sporting goods store.

Unlike many of the other so-called "contest" sites out there, these guys make everyone who enters any contest at WinSportingGoods.com, an automatic winner. Yep, just for entering any contest, you automatically receive great discounts from leading vendors on the products you love. Go check them out today. It's 100% free to enter as many contests as you wish, as often as you wish. They're located at www.WinSportingGoods.com. Trust us, you'll love the site! ■

SUPPLEMENT SIDEBAR

The newest flavor of Hammer Gel, Apple/Cinnamon, has been an overwhelming success! Nearly everyone agrees that it is as close to apple pie flavor as you can get. If you haven't tried this new flavor, you don't know what you're missing! Give it a try; we think you'll love it!

Even up here in northern Montana, the weather is getting warmer. Maybe it's already downright hot where you live and train. While Endurolytes should be used during every lengthy training session, now is the time you should definitely not skimp on a consistent intake of this incredible product. The electrolyte article on page one of this issue explains more about the necessity of electrolyte replacement.

Along the same lines, if you've had heat related problems before, perhaps this is the time you give Liquid Endurance serious consideration. It's an amazing product with dual benefits! Liquid Endurance will enable you to train and race at your peak, even on the hottest days, by helping reduce the potential for dehydration while maintaining a lower body core temperature. With the addition of L-Carnitine, this product will not only enable you to hyper-hydrate and allow the cells of the body to hold more water, it will also aid the body in utilizing its fat stores for fuel more efficiently. Full information about Liquid Endurance and all other E-CAPS products can be found on our website: www.e-caps.com, or just give us a call at 800-336-1977! ■

THE GREAT HAMMER PROTEIN DEBATE: WHICH PROTEIN IS THE BEST, HOW MUCH AND WHEN?

by Dr. Bill Misner, Ph.D.

The amino acid content of HAMMER PRO SOY & HAMMER PRO WHEY presents several obvious strengths of each in their respective amino acid profile. Soy's cardiovascular benefit is in a class by itself, while the bioavailable strength of Whey is without equal. Bioavailable strength is judged to be based on the complete amino acid that yields the most volume of essential amino acids per serving. Essential amino acids are those which the body cannot synthesize and are therefore diet-dependent. Dietary Soy however yields the most total protein of both essential and non-essential amino acids volume per ounce and yet Whey yields the most essential amino acids per volume.

HAMMER PRO'S ESSENTIAL AMINO ACID CONTENT

(mg per 26 grams)

Amino Acid	Hammer Pro Soy	Hammer Pro Whey
Leucine*	1546	2609
Isoleucine*	921	1333
Valine*	940	942
Threonine	714	962
Lysine	1184	2222
Phenylalanine	977	831
Tryptophan	244	595
Methionine	245	443
Arginine	1428	480
Histidine	489	425
TOTALS	8688	10842

*Branch Chain Amino Acids (BCAA)

HAMMER PRO'S NON-ESSENTIAL AMINO ACID CONTENT

(mg per 26 grams)

Amino Acid	Hammer Pro Soy	Hammer Pro Whey
Cysteine	244	869
Aspartic Acid	2180	2039
Alanine	808	230
Glutamic Acid	3589	2683
Glycine	789	78
Proline	940	179
Tyrosine	714	172
Serine	977	180
TOTALS	18929	14589

Essential + Non-essential Amino Acid Totals Total Protein

***FOOTNOTE:** These values approximate protein content in HAMMER PRO SOY & HAMMER PRO WHEY. Athletes are reminded that a single scoop serving of Soy weighs 36 grams, not 26 grams as does a single serving of Whey. Let's compare the protein content of foods, human milk, eggs, cow's milk, beef, whey, and soy in the next chart.

COMPARISON OF AA REQUIREMENTS TO AMOUNTS FOUND IN COMMON PROTEINS

(All values are mg AA/g protein)

Amino Acid	Human Milk	Egg	Milk	Beef	Whey	Soy
Histidine	26	22	27	34	16	19
Isoleucine	46	54	47	48	54	49
Leucine	93	86	95	83	89	82
Valine	55	66	64	50	82	48
Lysine	66	70	78	89	88	64
Methionine	42	57	33	40	32	26
Tyrosine	72	93	102	80	65	92
Threonine	4	47	44	46	65	38
Tryptophan	17	17	14	12	22	14
TOTALS	434	490	477	445	417	413

NR = not reported

REFERENCE: National Research Council. Recommended Dietary Allowances, 10th ed. National Academy Press, 1989 ; Values for whey hydrosylate are from Boza, JJ et. al. (12) and may vary slightly depending on how the whey is produced; Values for soy isolate (Supro-620) are from Young VR. (13).

PROTEIN RATED BY INDIVIDUAL AMINO ACID PROFILE (10-9-8-7-6-5): When a food protein source is rated by assigning a numerical rating (10-9-8-7-6-5) to each amino acid volume, the following scale rating is derived.

RATING PROTEINS BY INDIVIDUAL AMINO ACID

(10-9-8-7-6-5)

Amino Acid	Human Milk	Egg	Milk	Beef	Whey	Soy
Histidine	8	7	9	10	5	6
Isoleucine	6	10	7	8	10	9
Leucine	9	7	10	6	8	5
Valine	7	9	8	6	10	5
Lysine	6	7	8	10	9	5
Methionine	9	10	7	8	6	5
Tyrosine	6	9	10	7	5	8
Threonine	5	9	7	8	10	6
Tryptophan	9	9	8	7	10	7
TOTALS	65	77	74	70	73	41

- 1-EGG (77 points)
- 2-COW MILK (74 points)
- 3-WHEY (73 points)
- 4-BEEF (70 points)
- 5-HUMAN MILK (65 points)
- 6-SOY (41 points)

PROTEIN RE-RATED BY COMPLETE AMINO ACID PROFILE

However, since a protein is judged by its weakest amino acid, only three proteins can be considered "complete" thus revising the rating scale as follows: #1-Egg Whites (77 points), #2-Whey (73 points) and #3-Soy (41 points).

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ATHLETE SPOTLIGHT: MIKE FREEMAN

by Dr. Bill Misner, Ph.D.

What is it about road racing that appeals to you?

Road racing embodies many things. Camaraderie, tactics, bike handling, pack skills

and interpersonal skills that develop while trying to get a group on racers to work together for a common goal. The interesting part of that is only one of them will win.

Describe the equipment you use. Any particular reasons

Mike Freeman is a 58 year old (I had a hard time believing that after seeing him ride!) road cyclist who lives in Martinez, California. His race results go as far back as 1992 but some of his recent Road Racing, Criterium, and Time Trial TT results are quite impressive:

1999 Masters National Criterium Champion 55-59, 4th in the RR

1999 N. Cal Road Race Champion 55-59

1998 N. Cal. Road and Criterium Champion 55-59

1997 Masters National Championships- 2nd RR, 5th Criterium

1997 N. Cal. Criterium Champion 55-59

What other sports were you involved in and how did you end up choosing cycling and in particular road racing?

I have participated in quite a number of sports, but I think that my real competitive side came out when I started racing motocross in the late 60's through the 70's. Since then I have competed in water skiing, downhill skiing (snow that is) and now bicycle racing. I started cycling to strengthen my legs for downhill ski racing. I got hooked on cycling and started doing century rides with a friend. From there, as in all my sports, I gravitated to competition. Time trials at first, and then I tried my hand at a couple of road races. That's all it took.

How long have you been competing?

I began competing 1986.

for this particular frame/components?

I have a number of bicycles. Today I race on a Colnago Dream (aluminum) and a Trek 5900 (carbon fiber). I use Campi Record components. I use Zipp 404 (tubular) and Sestriere (clincher) wheels for racing. Building the lightest bicycle for racing is my goal. I use the 5900 for road racing, especially hilly terrain and the Colnago for criteriums. I have been using Campagnolo components for quite a number of years. It is very good equipment and I think easy to operate since my right hand goes numb during long bouts on the drops. The frames are selected for their weight, stiffness and comfort and the wheels for weight and durability. The lighter the better for good acceleration. I need all the help I can get since I'm not a pure sprinter.

Describe the typical Mike Freeman training week during peak season?

A typical training week during peak season would be, Monday-off, Tuesday-intervals, Wednesday-long recovery ride, Thursday-motorpacing, Friday-jumps/sprints, Saturday/Sunday-race. Time is usually 12-14 hrs per week.

What is your off season and what do you do in the off season to stay fit?

Off-season I snow ski and still ride my bicycle. I live in sunny (most of the time) California and I'm able to maintain some cycling fitness during the winter.

What supplements are you using? Fuel?

Supplements: Enduro Caps, Race Caps, Endruolytes, ATP 100, Anti-Fatigue Caps, Omegasource, Race Day Boost, Premium Insurance Caps, Tissue Rejuvenator, Phytomax. Fuel: Sustained Energy, Hammer Gel and Hammer Pro.

Can you pick out a "best moment" in your career, perhaps the best race you had? Describe what it was like and the results.

The best moment that I remember is when I won the National 55-59 Criterium in 1999. I had been trying for a number of years to win a National Championship and had come close on a number of occasions. With 3 laps left in the race I attacked and caught a solo break. Soloed the last lap but was caught in the last corner by a racer who had beaten me for 1st. At the Nationals Road Race in Tallahassee in 1997, we collided with each other in that final turn. I looked at him and yelled "Not

this time" and then outsprinted him to the line. Wow, what an exhilarating feeling!

Any really hairy moments in training or a race?

Well, I recently crashed and separated my right shoulder during a road race. Not my fault but the result of a racer getting mad and slamming on his brakes in front of the field, resulting in seven riders going down. I'll keep training and hope to make Nationals, which has been my goal since I missed out last year due to knee surgery.

If you were coaching a group of athletes interested in becoming better cyclists what advice would you give them?

Training advice: Make a plan, be consistent and be smart. The old adage of being 10% under trained is better than 2% over trained is very true. Recovery is the key to all good results. I also believe that older athletes need to maintain a minimum level of fitness during the off season or pay a heavy price when starting training for the next season. You can't just stop activity in your sport like a younger person can and come back as quickly as you would like. This causes an overtraining issue for older athletes as they tend to accelerate their training if they don't see results as soon as they would like. In some instances I've seen people who never attain the same or better fitness by taking off too long. ■

? ASK DR. BILL

QUESTION: Anyone know anything about "G-push" products?

ANSWER: "G-push" products contain galactose, a SIMPLE SUGAR, which is claimed to induce only 20% of the glycemic index of glucose. Interesting claim, due to their website indicating 0.72 Glycemic Index compared to glucose's 1.0, which mathematically is incorrect. Their products claim to supplement galactose with other sugars, maltodextrin and fructose, yet evoke no insulin response. At a carbohydrate concentration of 7.5%, their formula appears at the upper end of what can be transmitted in simple sugar content without provoking gastric rebellion into immediate shut down, if their electrolyte profile and fluid volume are not out of balance or depleted.

This product is very high in sodium content, of which I am personally opposed, with a whopping 190 mg sodium per 8 fl oz; a lot of sodium. It may be that this level of simple sugar needs a high volume of sodium to transit gastric straight. It would be interesting to hear how or if distal tissue edema occurs after prolonged use of a high sodium content. In addition, it contains other minerals; calcium, chromium, copper, iron, magnesium, potassium, chlorine and zinc. One may question the need to supplement iron or chlorine in an endurance sport. Since I do not have an ingredients label, nor does their website publish the ingredient list, like we do, I am not sure which of their products formulate wheat protein Isolate with glutamine and Lactoferrin, for which (in my opinion) is better after a workout than during. A token dose

of Vitamin C (30 mg) is included, but this may vary between products G-1 through G-4. One of their products is fortified with green tea extract, which I like, but I would not take it in a prolonged endurance effort.

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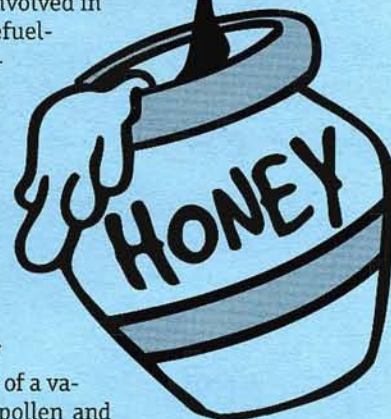
QUESTION: While popping Endurolyte capsules during racing, how long does it take to dissolve in the stomach and get into the system to take effect? I always take a swig of 3-4 oz of water with each one. If I take 3 per hour, is it better to take one every 20 minutes, or 3 at once and then wait an hour before taking another 3?

ANSWER: Exogenous micronutrient transit time is quite individual. Approximate time to the stomach is within 1-3 minutes, another 6-9 minutes is required to dissolve capsular covering, and depending on what is in the stomach (fat, meat protein, and fiber delay gastric emptying). Substrate absorption may be effected as early as 15 minutes to as late as 35 minutes in the majority of athletes. As a reminder, some minerals are not absorbed until they get to the colon (large intestine). Most minerals are absorbed more efficiently when in low supply, therefore if your stomach is empty or simply has a few hundred calories of easily digested carbohydrates the 15-35 minute repletion rate range could potentially become 12-25 minutes when demand is high and gastric environment is "hungering". Personally, I prefer 1 every 20 minutes taken with 6-8 ounces Sustained Energy or Water with 1 serving of Hammer Gel. I mix the Endurolytes in my water bottle, then simply shake it up prior to drinking. You will probably get other good suggestions from the list, which you should experiment with in like Race Event conditions to see which one fits you the best. The main reason I mix mine in the drink, is that while competing, I prefer not to be distracted, leaving me free to focus on the race. ■

HONEY OR HAMMER GEL?

by Dr. Bill Misner, Ph.D.

I have been told that Richard Kreider, brilliant sport scientist from the University of Memphis, is currently involved in testing honey as a gel refueling energy product for athletics. Honey could be good or it could be a not-so-good idea. Before jumping on the Honey Gel bandwagon, let us take a look inside the sweet and gooey bee "byproduct."



COMPOSITION OF HONEY

Honey is composed mainly of a variety of sugars, traces of pollen and water. There are also enzymes present. From 490 samples of largely uncrystallized honeys these are the results:

Levulose (%)	38.19
Dextrose (%)	31.28
Sucrose (%)	1.31
Maltose (%)	7.31
Higher sugars (%)	1.50
Undetermined (%)	3.1
Moisture (%)	17.2
pH	3.91
Free Acidity	22.03
Lactone	7.11
total Acidity	29.12
Lactone/Facid	0.335
Ash (%)	0.169
Nitrogen (%)	0.041
Diastase	20.8

HAMMER GEL or HONEY GEL

For each 1.6-tablespoon of honey, 99.42% of the 102 calories is simple sugar. Simple sugar can cross gastric membranes only in a 6-8% solution. Hammer Gel will cross gastric linings in 15-20% solution, meaning over twice as many calories from long chain carbs get into the systemic domain beyond intestinal straits. We all have seen how blood sugar curves are elevated parallel initially, however simple sugar curves appear to pose a below fasting baseline "Crash" mysteriously absent in the longer chain carbohydrates. The pH of honey (3.91) looks a bit on the acidic side, which is precisely why an endurance athlete should not eat even an orange slice, because during endurance exercise, stomach acid and systemic acid from muscle metabolism may increase.

I do not have nor could I locate Dr. Kreider's research findings, which I do not think are out yet, but for now, I think I will pass out honey to my competitors and keep the Hammer Gel secret and for my own use. ■

REFERENCE:

U. S. Dept. of Agriculture Technical bulletin 1261, "Composition of American Honeys" by J.W. White, Jr., M. L. Reithof, M. H. Subers, and I. Kushnir, 1962.

STEVE'S TOP 11 REASONS FOR AVOIDING SIMPLE SUGAR

by Steve Born

On the E-CAPS web site, we list 78 reasons why you should avoid consumption of simple sugars. The list seems to be growing daily! I've been looking at the list a bit and, while all 78 reasons are important, I came up with my top 11 reasons (I just couldn't limit it to ten) to avoid simple sugars. From that original list of 78 they are:

1. Sugar can suppress the immune system.

If your immune system is compromised you can't recover completely, negating the ability to make gains in training.

2. Sugar can upset the body's mineral balance. Sugar may lead to chromium deficiency. Sugar can cause copper deficiency. Sugar interferes with absorption of calcium and magnesium.

I lumped all of these together as one reason. It shows that not only does sugar throw off mineral balance but also it can lead to deficiencies in some and poorer absorption rates in others. I find this of particular importance in regards to electrolyte levels. If someone is using a sugar drink how can they expect to absorb decent amounts of two of the most important

electrolytes in calcium and magnesium? Taking care of electrolyte needs during exercise is a constant process that requires a lot of trial in training to find what works best for you. Why make things hard on your body regarding mineral balance by drinking products that contain simple sugar?

3. Sugar can produce a significant rise in triglycerides.

Triglycerides make up most of the fat that you eat and most of the fat that circulates in your bloodstream. They're essential for good health and your tissues rely on triglycerides for energy. But as with that other essential molecule, cholesterol, high triglycerides may also be linked to heart disease. Excess triglycerides are easily stored as body fat (see #4).

4. Sugar can contribute to weight gain and obesity.

It can be hard enough to maintain the body weight we should be at for optimal performance. Ingesting sugar is the wrong way to keep your weight at the level you've worked so hard to achieve.

5. Sugar raises the level of a

neurotransmitter called serotonin, which can narrow blood vessels.

Just as important, perhaps even more so during competition, high serotonin levels are believed to be a possible cause for mental and physical fatigue. Serotonin is released in large quantities as we fall asleep. Sugar, because it raises the level of serotonin can potentially make us feel lethargic and sleepy, not what you need during a race!

6. Sugar can produce an acidic stomach.

If you've ever experienced that uncomfortable, burning stomach and throat, you know what I mean. Make things a lot easier on your stomach by avoiding simple sugars.

7. Sugar can decrease growth hormone.

Proper GH levels are necessary for immune system function and recovery. Any decrease would inhibit normal recovery

8. Sugar can change the structure of protein causing interference with protein absorption.

This would be disastrous during long distance events as 5-15%

our fuel requirements come from protein. It's even more of a factor in the recovery process where adequate protein is an absolute necessity.

9. Sugar can cause free radical formation in the bloodstream.

This has negative implications not only for recovery but health in general. Free radicals are believed to be the reason for degenerative diseases.

10. Sugar can cause loss of tissue elasticity and function.

This would be something that would negatively affect the quality of training due to inflammation of joints and compromised flexibility. Our joints may already take a beating; why make it harder on them by ingesting simple sugars?

11. Sugar can increase the body's fluid retention.

I have seen many ultra marathon cyclists trying to continue competing while bloated up due to water retention. This fluid retention can result from too much sodium and too much sugar and is not only uncomfortable but negatively affects performance as well. ■

CARBOHYDRATES FOR RECOVERY - SIMPLE VS. COMPLEX

by Dr. Bill Misner, Ph.D.

Many recovery products include simple sugars as part of the carbohydrate content. Some companies go so far to suggest it's necessary to ingest simple sugars to enhance the recovery process. But is this true? Dr. Misner has provided the answer and his commentary using a well-designed study to support his conclusions.

Seven untrained male subjects participated in a double-blind, crossover study conducted to determine the efficacy of different carbohydrate drinks in promoting carbohydrate storage

in the whole body and skeletal muscle during recovery from exhaustive exercise. The post-absorptive subjects first completed an exercise protocol designed to DEplete MUSCLE GLYCOGEN, then consumed 330 ml of one of three carbohydrate drinks:

These results suggest that the consumption of a glucose polymer drink, containing 61 g carbohydrate (244 calories) promotes a more rapid storage of carbohydrate in the whole body, skeletal muscle in particular, than an iso-energetic sucrose drink (1).

DRINK	GLYCOGEN RESTORED
1. 18.5% glucose polymer	5.31 mmol. kg wet wt(-1). h(-1) ± 1.11
2. 18.5% sucrose	4.07 mmol. kg wet wt(-1). h(-1) ± 1.05
3. 12% sucrose	3.45 mmol. kg wet wt(-1). h(-1) ± 0.85

COMMENTARY

The human endurance model replenishes depleted glycogen stores better from long chain carbohydrates post-exercise. Is it also likely that this same model during depletion would also respond similarly? Avoid simple sugars...all the time is my conclusive suggestion, give to your musculo-physiology what it is most receptive. ■

REFERENCE

1. Effect of different carbohydrate drinks on whole body carbohydrate storage after exhaustive exercise, J. L. Bowtell, K. Gelly, M. L. Jackman, A. Patel, M. Simeoni, M. J. Rennie J Appl Physiol 2000;88 1529-1536.

SIBERIAN GINSENG FAILS AGAIN!

The Final Word on Endurox and Endurox R4

by Steve Born

In a recent study (Int. J. Sports Nutr. Exerc. Metab. 10: 444-451, 2000) Siberian Ginseng once again failed to live up the claims companies have made about it. Ginseng in its many forms has been used by endurance athletes in the hopes of increasing fat use while sparing glycogen.

This well-designed, well-controlled study by Dr. Christopher Eschback and colleagues at the University of Southern Mississippi demonstrated that Siberian Ginseng **did not affect fat use during exercise or improve performance**. The "active" ingredient in Endurox, Endurox Excel and Endurox R4, is a standardized extract of the herb ciwujia, which is simply a weed-like cheap cousin to Ginseng.

In essence, this study indicates that using the Endurox or Endurox Excel supplement would be a waste of your money. And, although Endurox R4 has some nice elements to it as a recovery drink, why spend the extra money on a proven ineffective ingredient?

DR. MISNER'S VIEWS...

ADAPTOGEN RESEARCH—ENDUROX

Adaptogens are food-grade herbal substances sold under a variety of names by health food companies. It's claimed that they can speed up recovery from physical exercise and gain additional stamina and endurance. It's hard to find good research studies supporting the claims, so I went with interest to two poster sessions that attempted to evaluate whether claims of improved performance associated with the commercially marketed adaptogen, Endurox, were valid. Triathletes in the United States are familiar with Endurox. Go to any major US triathlon and odds are you'll find a sample package of Endurox in your race packet. Clever marketing. What

athlete doesn't want to "slow lactic acid buildup that causes muscle soreness and fatigue"?

Endurox (ciwujia, eleuthera, or a form of Siberian ginseng, a natural root grown in China), like many natural food supplements, is not regulated by the US Food and Drug Administration. Used as directed, the product claims to help an athlete metabolize up to 43% more fat calories per workout. Cheuvront, Moffatt and other researchers from Florida State University used a double-blind crossover design and randomly assigned subjects to consume the recommended dosage of Endurox for seven days or a placebo. The subjects performed cycle ergometry as researchers collected and continuously analyzed expired gases.

ENDUROX DOES NOT SUPPORT PERFORMANCE DEMAND

The findings did NOT support the ergogenic claims of Endurox of reduced lactate production or faster heart rate recovery. Dustman and others from Northern Illinois University used a double-blind balanced randomization design to measure physiological response to a stair-stepping exercise session. Results did NOT support advertised claims by Endurox to increase fat metabolism, decrease lactate accumulation, heart rate and feelings of fatigue during exercise.

REFERENCED FROM:

www.sportsci.org

This new study only solidifies the findings from the Northern Illinois study. Bottom line: Ciwujia does not work! Many of the field reports from our athletes support the conclusion written from the scientists who composed the above reviews. Cramping, muscle spasms, and dehydration were the most frequent reports with very few noted improved performances. Even small amounts of ginseng

have been associated with raising excitatory hormones, which may not contribute to endurance performance at all.

About Endurox R4 as a whole, Dr. Misner says, "The best thing I can say about Endurox R4 is it provides an ideal Optimum Recovery Ratio of 4:1 (4 grams of carbohydrate to one gram of protein) to deliver the benefits of protein without negatively affecting rehydration and glycogen restoration. Make no mistake; this is a good macronutrient ratio post-exercise.

However when one looks for real, reliable, statistically significant research to support the product claims, none exist but weak experimental data collected and summarized by the hired independent organization funded by the manufacturer. Most Endurox products are formulated to contain small amounts of Eleuthera (Ciwujia) processed from the natural Siberian Ginseng root grown in China. This product claims to help an athlete slow lactic acid buildup, reduce fatigue, enhance recovery, and metabolize 43% more fat calories per exercise session. Sounds good but it does not deliver. In fact, it may be just the opposite."

"The results of Dustman's study **DID NOT** support advertised claims of Endurox to increase fat metabolism, decrease lactic acid, or reduce fatigue during or AFTER exercise. Cheuvront's study, using a double-blind crossover design and randomly assigned subjects to consume either Endurox or a Placebo for 7 days of each, asked their subjects to perform cycling ergometry as they collected expired gases for analysis. These findings also did not confirm the ergogenic claims made by the Endurox manufacturers, since the collected expired gases **DID NOT indicate reduction in lactate, and NEITHER WAS RECOVERY faster as confirmed by heart rate.**"

"While I support the rationale for a 4:1 Carbohydrate:Protein recovery-macronutrient profile, the rest of this formulae creates doubt. You could add one-half tablespoon of Hammer Pro (Whey Protein Isolates) to 3 scoops Sustained Energy to achieve the recovery optimal 4:1 CHO:PRO ratio, and get all the benefits of lipotropic factors Carnosine, Carnitine, Choline, and Chromium Polynicotinate for max-recovery without the worry of the

(continued on page 10)

RECOVERY FORMULA COMPARISON	Endurox R4	SE (3 scoops)/ Hammer Pro (1 1/2 scoop)
Calories	280	380
Carbohydrates	53 grams	74 grams
Sugar	30 grams	1 grams
Fat	1.5 grams	0 grams
Protein	14 grams	18.75 grams
Vitamin C	470 mg	0 mg
Vitamin E	400 IU	0 IU
Calcium	100 mg	0 mg
Magnesium	250 mg	0 mg
Sodium	230 mg	129 mg
Potassium	140 mg	112 mg
Total L-Arginine	1735 mg	692 mg
Glutamine/Glutamic Acid	2539 mg	3379 mg
BCAA	2717 mg	3066 mg
Carnitine	0 mg	50 mg
Choline	0 mg	25 mg
Carnosine	0 mg	100 mg
Chromium Polynicotinate	0 mg	100 mcg
Ciwujia	600 mg	0 mg

Bill Misner, Ph.D. says, regarding proper electrolyte replacement, "Give it 35-45% even though it cries aloud for 110%."

SO WHAT IS THE ANSWER? HOW SHOULD I REPLACE ELECTROLYTES?

The solution for proper electrolyte replacement during endurance exercise is to do it gradually and in a way that does not override normal body mechanics. Electrolyte intake needs to be below systemic detection, yet provide support to systemic depression. This simply means that you have to take in enough to support body functions while also preventing heat related issues such as cramping. But it also meant that electrolyte intake can't be too much as to overwhelm the body and what it can handle. Put another way, when consuming electrolytes, it has to be done in a way that falls under the "radar detection system" of the body while still providing optimal support.

The **ENDUROLYTE** formula was designed to counter the effects of hyperthermia and enhance endurance performance, especially beyond the 3-hour mark. The levels of each nutrient contained in **ENDUROLYTE** are enough to aid the body in electrolyte loss while going undetected by the hormones which regulate normal body mechanisms. There are certain parameters we believe an electrolyte product needs to be within. And because the body has a meticulous way of mediating sodium and/or fluid retention and excretion, going above or below those parameters will result in performance-inhibiting effects.

ENDUROLYTE is not formulated to reflect the amounts of electrolyte loss in sweat. Why? Because each human being is different and has a different electrolyte pattern. The differences in an athlete's size and fitness, as well as the rate of pace and during exercise, and of course, the humidity and heat effect can mean up to a 100%

difference when one athlete's sweat rate is compared to another's. In the purest sense, **ENDUROLYTE** is not so much an electrolyte replacement product but is better described as an "ELECTROLYTE STRESS SUPPORT FORMULA." They help the body perform better under the demands of exercise, especially in heat, without overriding normal body mechanics. They work with the body, not against it.

WHAT ARE CHELATED MINERALS AND WHY DO ENDUROLYTE CONTAIN THEM?

Chelation is the pharmaceutical process of bonding each mineral to an amino acid. This bonding makes it easier to digest and assimilate each mineral for proper utilization in the body. Chelated minerals are the form most often recommended because they provide greater absorption than their non-chelated counterparts. For example, magnesium is absorbed 87 percent when chelated, but only absorbed 16 percent when taken in an inorganic, non-chelated form.

One nutrition scientist wrote, "Estimates of normal mineral absorption average 10%; however absorption of chelated minerals may be as high as 60%..."

WHAT DO ENDUROLYTE CONTAIN? WHY DO THEY CONTAIN THESE NUTRIENTS? WHAT IS THE RATIONALE FOR THE DOSE USED IN THE FORMULA?

CALCIUM is the most abundant mineral in the human body (about 2.85 pounds in the average person). When blood volumes run low, the body extracts it from the bones, but this may take more time than competition allows. A constant blood calcium level is required for a normal rhythmic heartbeat, healthy nerve transmission, and strong muscle contractions. A deficiency in blood calcium levels during endurance events may produce high blood pressure,

muscle cramps and weakness. During exercise, energy is produced by the conversion of fatty acids and amino acids with enzymes, which are calcium-dependent. Because fatty acids are such an important fuel during endurance exercise, providing 60-65% of your energy needs when exercise goes beyond two hours in length, having adequate calcium available to efficiently convert them into energy is crucial. 150-300 mg/hr is an adequate dose of calcium to help maintain the aforementioned body functions.

MAGNESIUM accompanies calcium in an ideal ratio of 1:2. When calcium flows into working muscle cells, the muscle contracts, then, when calcium leaves and magnesium replaces it, the muscle relaxes. Deficiency of magnesium contributes to muscle cramps, tremors, sleep disturbances, and in some cases, convulsive disorders. Many enzymatic reactions necessary for fuel conversion to muscular energy occur in the presence of adequate magnesium. Simply put, if the body doesn't have a sufficient supply of magnesium, energy production is compromised. 75-150 mg/hr adequately replenishes magnesium even though 100 mg is lost in sweat alone each hour (with much more used up by the muscles).

POTASSIUM is the chief cation (positively charged ion) within all muscle cells, necessary for maintaining the lowest optimal concentration and balance of sodium. Potassium deficiency symptoms are nausea, vomiting, muscle weakness, muscle spasms, cramping, and rapid heart rate. 75-150 mg/hr is an adequate replenishment amount. Even though 100-200 mg are lost in sweat alone (not counting internal muscle and cell use), if we try to replace it all at once, optimal sodium balance is altered. In addition, too much potassium is hard on the stomach and can cause severe stomach distress.

SODIUM is the chief cation (positively charged ion) outside the cell. American dietary practices cause the average person to carry 8000 mg. excess sodium in the extra-cellular tissues. During endurance events, 3-4 hours are necessary to deplete the "excess" of this mineral. Deficiency may begin to occur after 4 hours, which may produce symptoms of abnormal heartbeat, muscle twitching, and hypoventilation. However, if sodium is replaced at the same rate as depletion it overrides all the mechanisms involving Aldosterone, a hormone, which causes the body to conserve electrolytes. If you want to throw a wrench into your body's very intricate way of regulating electrolyte balance, if you want to see your hands, feet, wrists, ankles and other body parts retain water and swell up, indiscriminately dumping copious amounts of sodium in your system can make this a real possibility. We highly recommend a more gentle approach and advocate the use of 120-240 mg/hr of sodium against rate of loss ranging from 1800-3500 mg. per hour.

CHLORIDE is the relative anion (negatively charged ion) which must accompany sodium in the extra-cellular tissues. This mineral is absolutely necessary in maintaining the osmotic tension in both blood and extra-cellular fluids. It's a somewhat complicated process but to put it in the simplest terms, think of osmotic tension as being the proper balance and consistency of body fluids and electrolytes. We believe 180-360 mg/hr as part of the sodium chloride (a.k.a.: sodium) mixture is an adequate replacement amount without overriding the functions of aldosterone in regulating and conserving proper sodium and electrolyte levels.

MANGANESE is included in **ENDUROLYTE** as it is necessary in trace amounts for optimal

(continued on page 11)

**Protein Digestibility
Corrected Amino Acid Score
(PDCAAS)**

Protein	PDCAAS
Egg	1.00
Whey	1.00
Soy	1.00
Beef	0.92
Pea	0.73
Oats	0.57
Peanut	0.52
Rice	0.47
Corn	0.42
Wheat Gluten	0.25

Egg protein does have an excellent amino acid profile, but tends to interfere with some nutrient absorption, moving Whey into #1, Soy #2, respectively. Whey protein has less cardiovascular-enhancing qualities than Soy, may give off ammonia during metabolizing, and may require more Vitamin B-6 & B-12 too, indicating Soy as the preferential protein source during endurance training with Whey proteins favored during strength or short-term speed work, or after extreme endurance efforts. When rabbits were fed various foods then were examined for blood serum cholesterol after 28 days on each protein, the following results in serum cholesterol were reported:

Protein Source	Resultant Cholesterol (mmol/L)
Soy Protein Isolates	0.4
Soy Protein Concentrate	0.6
Peanut Protein	2.1
Wheat Gluten	2.1
Egg White (raw)	2.7
Pork Protein Concentrate	2.8
Beef Protein Concentrate	4.1
Casein (from milk)	5.2
Skim Milk	5.9
Whole Egg Protein	6.1

**AMINO ACID'S FROM THE
SAME CLASS COMPETE FOR
BLOOD-BRAIN BARRIER
TRANSITION**

There are 4 main classes of amino acids. When amino acids from the same class are present simultaneously within 60-90 minutes ingestion they will compete against each other for blood-brain transmission. When

a free-form amino acid is separately ingested apart from amino acids from the same class more of it will cross blood-brain barrier for effect. Glutamine, Arginine, Tryptophan, Glycine, the BCAA's (Leucine, Valine, and Isoleucine) are favored free form amino acids for enhancing hGH release relative to optimal muscle recovery cycle. Each of the 4 classes with corresponding amino acids are listed:

1 - LARGE NEUTRAL CLASS: Tryptophan-Phenylalanine-Tyrosine-Methionine-BCAA's, Leucine, Valine, and Isoleucine.

2 - SMALL NEUTRAL CLASS: Asparagine-Glutamine-Proline-Serine.

3 - ACIDIC CLASS: Glutamic-Aspartic.

4 - BASIC CLASS: Arginine-Ornithine-Lysine.

**SUGGESTED RATINGS FOR
THE "WORLD CHAMPION"
PROTEINS**

The former (above) suggests separate specific applications for each of the complete proteins factored in results for Top Endurance Exercise Protein Rating:

1-Soy & Whey Mixed @ 2:1 or 1:2 (100 Points)

2-Soy (90 Points)

3-Whey (85 Points)

4-Egg Whites (75 Points)

5-Other Combinations Resulting In Complete Amino Acid Profile (75 Points)

EDITORIAL COMMENT: The amino acid class value of a protein may effect the biological value of each protein source. Differing muscle resynthesis may beneficially occur from the dietary provision of proteins in a mixed format. One protein may have a better effect if it is mixed with another based on the strength and weaknesses of its amino acid profile. Only 3 protein amino acid profiles have been rated as "Complete" or with a perfect PDCAAS score of 1.0. "Complete Proteins" are soy, whey, & egg whites.

PDCAAS means "Protein Digest-

ibility Corrected Amino Acid Score." An argument suggesting a 2:1 ratio of Whey:Soy during strength or speed training cycles, always in a 4:1 carbohydrates to protein ratio calculated as total dietary protein of 1.7 grams/ kilogram bodyweight. During endurance training cycles one may contend use of a 2:1 ratio of Soy:Whey in a 4:1 carbohydrates to protein mix calculated for total dietary protein volume of 1.4 grams per kilogram bodyweight.

EXAMPLE: A 70 kg athlete post (after) during strength/speed training may consume 2 scoops WHEY to 1 scoop SOY (61 grams protein) to 240 grams carbohydrates. The total daily protein for this athlete during strength or speed work should be higher at 1.7 grams per kilogram bodyweight, or 119-120 grams protein. During endurance training cycles, 2 scoops SOY to 1 scoop WHEY may be consumed for 70 grams protein value with 280 grams carbohydrates. Endurance training therefore requires less protein per kilogram bodyweight at 1.4/kg, or 98-100 grams each day. Endurance training muscle resynthesis simply requires -0.3 grams LESS protein per kilogram body than does strength or speed training. There are other arguments favoring other combinations of complete PDCAAS proteins or combinations other incomplete protein sources. Too much dietary protein above 1.7 grams per kilogram body weight is unnecessary, systemically elevating nitrogen, ammonia, urea, which may lead to dehydration, further stressing both liver and kidneys inhibiting ergogenic benefit. Athletes consuming more protein than required may further react with inflamed kidneys, low-back pain, and feelings of malaise. More is not always better; but balance is always key. (1) Not everyone agrees with this assessment. ■

REFERENCE

(1)-Misner, W.D., The Great Hammer Protein Debate: Which Protein is the Best, How Much and When? THE JOURNAL OF ENDURANCE:2001:#(8).

stimulatory ginseng effects on your metabolism."

Note: amounts of certain ingredients in Sustained Energy/Hammer Pro mix are not on the label but have been calculated for comparison. Note that over 1/2 of R4's carbohydrate composition is simple sugars. The Sustained Energy/Hammer Pro (SE/HP) recovery drink provides nearly 30% more carbohydrates than R4 and only one gram of simple sugar (naturally occurring in whey).

SE/HP also provides nearly 30% more protein than R4, which contains 25% more of the necessary glutamin/glutamic acid amino acids, and nearly 12% more Branch Chain Amino Acids (BCAA). I believe that when you're looking for an optimal recovery drink you need enough carbohydrates and protein to replenish muscle glycogen stores and help tip the scales in the direction of protein creation and less towards protein catabolism. I believe the combination of Sustained Energy and Hammer Pro does exactly that and better than Endurox R4. For more insight on why complex carbohydrates are preferable to simple sugars for recovery, check out Dr. Bill's article on page seven of this issue. ■



muscle cell enzyme reactions for conversion of fatty acids and protein into energy. Again, fatty acids and protein are an important, even crucial part of the endurance athlete's fuel supply, so while manganese is not technically an electrolyte, its importance cannot be overstated. Research also shows that manganese deficiency plays a vital role in blood sugar regulation, free radical build up from intense exercise, and nerve function disorders, especially in older athletes. 5-10 mg./hr will help resolve these issues and is another reason why it is included in ENDUROLTYES.

PYDROXINE HCL (vitamin B-6) is a coenzyme that performs in 60 enzymatic reactions involving metabolism of carbohydrates, fats, and protein. We include this water-soluble B vitamin in ENDUROLTYES because of its active role in maintaining sodium-potassium balance.

L-TYROSINE is an amino acid, which has been added because when blood plasma deficiencies occur during extreme endurance events, low thyroid and low adrenal production result. The lack of performance of adrenal and thyroid glands due to endurance-exercise-induced L-tyrosine depletion hinders the proper rate of metabolism. A deficiency in blood serum L-tyrosine amino acid first appears as depression, later anger, then despondency which degenerates into total despair. If any of these has ever happened to you during a long training bout or race, it may be due to low thyroid and adrenal production and can be easily avoided by the intake of supplemental l-tyrosine at 50-100 mg/hr.

ENDUROLTYES vs. OTHER FORMULAS

ENDUROLTYES

(120 capsules/\$14.95)—1 capsule contains 50 mg calcium (as calcium chelate), 25 mg magnesium (as magnesium chelate), 25 mg potassium (as potassium che-

late), 40 mg sodium (as sodium chloride) 60 mg chloride (as sodium chloride), 1.6 mg manganese (as manganese chelate), .6 mg vitamin B-6 (as pyridoxine HCL), 16.6 mg L-tyrosine

SUCCEED!

(100 capsules/\$10.95)—1 capsule contains 344 mg sodium (as sodium chloride, bicarbonate, citrate, phosphate) 21 mg potassium (as potassium phosphate).

This product is almost entirely made up of sodium and, as mentioned earlier, sodium alone (or even sodium and potassium) cannot fulfill electrolyte requirements and may be totally counterproductive for enhancing performance.

THERMOTABS

(100 tablets/\$9.95)—1 tablet contains 180 mg sodium, 15 mg potassium, 450 mg sodium chloride, 30 mg potassium chloride

This product is not much different than SUCCEED! and may be harsh on the stomach due to it being in tablet form. I have often found that tablets take longer to dissolve and can irritate the stomach lining.

ENERVIT GT

(24 tablets/\$7.95)—1 tablet contains 2.4 mg magnesium (as magnesium aspartate), 3 mg sodium (as sodium chloride), 6 mg potassium (as potassium aspartate), 4 mg Aspartic Acid

If there was ever a product that is over priced it's this one. Look at the amounts of electrolytes in the product; a bottle may be enough to take care of an hour's electrolyte requirements! And \$7.95 for 24 tablets that contain very little? No way! This product more closely resembles maybe one capsule of Anti-Fatigue Caps.

Testing ENDUROLTYES during training will help you, the endurance athlete, find the proper dose for your personal biochemistry and enable you to achieve the optimum level of perfor-

mance during the longest of events, no matter what the temperature may be. ■

Steve Born is a technical advisor for E-CAPS with over a decade of involvement in the health food industry. He is a three-time RAAM finisher, the 1994 Furnace Creek 508 Champion and 1999 runner-up, and is the holder of two Ultra Marathon Cycling records.

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ENDURANCE NEWS MISSION STATEMENT

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 to 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, EN 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.

Brian Frank
Editor

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THE BACK PAGE

WE'RE AT THE RACES - SEE YOU THERE!

We really lucked out this year with the three major amateur champions all being located in the Pacific Northwest. We just couldn't resist the temptation to sponsor and attend these events.

So, those of you who will be attending these events, be sure to look us up. If we sponsor you individually or as a team, please check in with us at our booth to make arrangements for photos and other assistance with manning booths and such (No, not just before your race and not much more than an hour or two unless you want to do more.). All athletes are invited to join us and to meet Brian, Steve and Dr. Bill. We will have plenty of

Hammer Gel and some other healthy treats to share with you. We're looking forward to seeing you there!

We'll be at the following three events:

The Masters Road Cycling National Championships in Spokane, Washington on Saturday July 7th through Thursday July 12th. More information about this event can be found at: www.roundandround.com/masters.htm

The Masters Track Cycling Championships at the Marymoor Velodrome in Redmond, Washington. Dates are Friday, July

13th through Wednesday, July 18th. More information about this event can be found at: www.marymoor.velodrome.org

The USAT National Age Group Triathlon Championships in Coeur d'Alene, Idaho on September 1st, 2001. More information about this event can be found at: www.roundandround.com/TriNats.htm

We hope to see you! ■

