



ENDURANCE NEWS

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The endurance athlete's comprehensive knowledge resource since 1992

Over 45,000 mailed quarterly!

Pg 2	Welcome
Pg 4	From The Saddle Of Steve Born
Pg 7	Work for Hammer!
Pg 8	Product Spotlight :
	Race Caps Supreme
Pg 12	Don't Get Lost, Get A Map
Pg 13	Primal Quest Coming To Montana
Pg 14	Just Use Your Head
Pg 15	Multiple Vitamins or
	Multiple Supplements
Pg 16	Off-Season Exercise
Pg 18	Join the E-Stim Revolution
Pg 20	Building Your Base
Pg 23	2007 Sponsored Events
Pg 24	Hammer Camp
Pg 26	Glycogen Synthesis/Carbo Loading
Pg 28	Athlete Spotlight : Michael Emde
Pg 32	Helpful Hints To Lose Fat
Pg 34	Chromium
Pg 35	Casein : A Quality Protein Choice?
Pg 36	Commit To Wear #1 In 2008
Pg 37	The 4 Hour Bottle
Pg 38	JAMA Antioxidant Study
Pg 39	Pearls Of Wisdom From Dr. Bill
Pg 40	Knowledge Resources
Pg 41	Nate's Corner
Pg 42	From The Archives
Pg 43	From Soni's Kitchen
Pg 44	Supplementation
Pg 48	Hammer Champions
Pg 49	Price List And Order Form
Pg 51	2007 Furnace Creek 508
Pg 52	Race Report

High Fructose Corn Syrup is associated with obesity, no myths about it!

Bill Misner, Ph.D.

Some well-established science differs sharply from an article by White and Foreyt in Food Technology¹ about the safety of high fructose corn syrup (HFCS). Bray, et al's 2004 article² detailing the harmful effects of dietary HFCS provides much "food for thought." All quotes in this article are from that highly regarded paper.

Also, I disagree with White and Foreyt's use of the term "myth" (in the title of their Food Technology article) regarding

the claims against HFCS safety. I prefer the epidemiological evidence that Bray, et al provide for an association between high HFCS consumption and obesity with compromised health issues. Below is the abstract from their paper:

Obesity is a major epidemic, but its causes are still unclear. In this article, we investigate the relation between the intake of high-fructose corn syrup (HFCS) and the development of obesity.

see HFCS on page 6

Aspartame Hypothesis

Bill Misner, Ph.D.

I disclose this is a rational hypothesis requiring careful inspection. For years, I concluded (by observation, study, basic biochemistry) that some humans (unknown %) could safely metabolize aspartic acid, phenylalanine, and methanol separately or simultaneously. I hypothesized that this "may-" -be true even if aspartic acid, phenylalanine, and methanol were consumed as the compounded proprietary altered substance called "Aspartame".

Aspartame is a compound consisting of L-Phenylalanine + N-L-alpha-aspartyl- + 1-methyl ester. When aspartame is consumed, its aspartylphenylalanine component is reduced to two amino acids (aspartic acid + phenylalanine) and an amino acid, phenylalanine joined to a methyl ester, then it is metabolized to methanol. The maximum amount of Methanol that can be ingested without serious toxicity is calculated at 7.8 mg. A 30 ml dose of 1.014 fluid ounce pure methanol is lethal (28696 milligrams). Methanol content associated with death

requires around 96 liters from highest methanol drinks:

METHANOL PER LITER

Brandy 200-300 mg
Vodka 1-300 mg
Whisky 80-200
Red Wine 60-100 mg
White Wine 20-40 mg
Beer 1-10 mg

A single liter of hard liquor can kill you if it is consumed too rapidly due to the fluid volume issues or other toxic effects generated. If there is this much methanol in alcohol, is methanol harmful to humans?

Aspartame "may" be harmful from less dose

A toxic byproduct of aspartic acid hydrolysis is Diketopiperazine [DKP]. DKP is produced during the storage of Aspartame but it may also be

see ASPARTAME on page 3



Hammer headquarters Photo - Angela Nock

From the office of Brian Frank



Happy New Year! I hope that you are looking forward to 2008 with as much anticipation and excitement as I am. This issue of Endurance News is our biggest

ever and is full of great articles to inform, entertain, and encourage you to reach new heights in your athletic performance and physical health. Just since last January, Endurance News has grown from 32 pages to 56 pages and increased in circulation from a little over 30,000 to over 45,000. Right on course.

The articles you will find in this issue of Endurance News - highlighting the dangers of high fructose corn syrup and artificial sweeteners, the safety, necessity, and efficacy of prudent supplementation, and the success of athletes employing our "less is best" fueling philosophies - provide a rare alternative to what you typically read elsewhere. Endurance News, and all of our other publications and website, will continue to reinforce our positions on these important issues. It is heartening to know that our message is getting out, even to the competition. We've seen companies reformulating their products to reduce the fructose content and "experts" who changed from advocating "replace what you lose" fueling strategies to our "replace only as much as you can assimilate" philosophy. Perhaps they "saw the light" independent of our admonishments. Perhaps you had something to do with it with your feedback to them. Regardless of the specific reasons, we are just glad to see the tide turning and will continue to encourage this paradigm shift in every issue of this publication and every other

opportunity that presents itself.

Reflecting back on 2007, it was a great year for Hammer Nutrition and I sincerely hope that it was for you too. For those of you who suffered injuries or other setbacks, hopefully some valuable lessons were learned that will make you a better athlete and person going forward, which will help you in 2008 and beyond. For the rest of you, congratulations on a season well done and the realization of your goals through hard work, determination, and perseverance. We get the most satisfaction from helping you get there.

With your strong support, the growth of Hammer Nutrition in 2007 continued unabated, exceeding 2006 sales by over 40%. Retail sales led the way, but we also saw good growth in our direct channel, clothing, and accessories as well. As with everything that happens here, you deserve much of the credit for this trend and hopefully can also see the benefits in having Hammer Nutrition products more widely available in retail outlets. Thank you for supporting our retailers with your purchases and encouraging them to stock our products and restock them after they fly off the shelves. With your continued encouragement, they'll bring in the full line of Hammer products so you can enjoy the convenience of one stop shopping at your favorite shop.

While growth is the goal and is generally a good thing, it has made for a wild ride at times and my staff deserves a lot of credit for their adaptability in the face of constant change. But mostly, it is you, our most valued asset, who deserves the biggest pat on the back. It's no mystery that we would not be here doing what we do if not for you. Please accept my sincere gratitude for your support

and loyalty this past year, and all of the years before. My goal for 2008 is to continue to earn your trust and support.

As has been the case for 21 years now, in 2008 we will continue to provide you with the most effective fuels and supplements on the market, backed by unusually friendly customer service and all of the knowledge that we have accumulated over the past two decades. In addition, we'll be introducing some exciting new products, endorsing new brands, offering new variations of existing products, featuring enhanced website functionality, and more.

Here are some of the things you can look forward to:

New Body Care products - Coming quickly on the "heels" of Hammer Balm, we bring you Cool Feet. Cool Feet is a super concentrated, anti-odor, anti-fungal foot powder which contains no petroleum products, harsh chemicals, or metals. Best of all, it smells nice and leaves your feet feeling good. It can be used in your everyday shoes, but really shines when the conditions get extreme during exercise in the heat. Ask for a free sample on your next order. Remember, a little goes a long way, so no need to fill your shoes or socks like other products, just a little sprinkle is all it will take to get the desired results.

The third product in our Body Care line will be available shortly after you read this. It's called Soni-Pure, a name that Dr. Bill coined using my wife's nickname. Soni-Pure is a hand sanitizer that also uses no petroleum products or chemicals. You've probably heard that (and hopefully practice) good personal hygiene and specifically frequent hand

see BRIAN on page 3

BRIAN from page 2

washing is the best way to avoid illness and prevent the spreading of germs. This has led to the rise and frequent use of waterless hand sanitizers. However, most if not all of these products are alcohol based and contain chemical ingredients, thus creating the need for an effective alternative. If you are a frequent user of hand sanitizers, Soni-Pure will be a welcome alternative. If you don't use them because of their composition, you will now have a viable product to use. Check our website for availability.

Hammer Whey single serving packets - Our premium isolated whey protein has become quite a popular product among our clients, especially immediately before bed. This has prompted us to offer it in the convenience of single serving packaging. As is the case with HEED, Perpetuem, Sustained Energy, and Recoverite, you can now purchase Hammer Whey in single serving pouches, 6 to a box. We are also experimenting with several flavor variations and will announce those as soon as we've got a winner, or two.

HEED 80-serving - You asked for it, so we delivered. If you are one of the athletes who uses HEED with regularity and seem to go through our 32-serving container before you know it, this is what you have been looking for. At \$44.95, it's also a good deal too because you are getting 16 extra servings for just \$5 compared to the 32-serving price. The 80-serving size will initially be offered in Lemon-Lime and Mandarin. Depending on popularity and demand, we may offer the Plain HEED in this size in the future.

We are also working on some new flavors for HEED and Perpetuem. I hope to be able to announce them in the spring issue of Endurance News.

Before signing off, I'd like to point out a special message to all of our Compex buyers and draw your attention to our first ever "job ad".

In closing, I hope that 2008 is your best year yet. We are here, ready to help make sure that it is.

Enjoy the read!
Brian Frank
Proprietor

ASPARTAME from page 1

synthesized within the body after Aspartame consumption. Research has not yet determined whether DKP is synthesized increasingly within the human body from ingested aspartame. DKP already formed within aspartame during storage will harmfully affect optimal human cell health. Every 180 days humans replace-regenerate new cells in soft tissue sites. Diketopiperazine [DKP] and methanol substances may with chronic use may alter optimal "hoped-for" effects of DNA/RNA cellular growth patterns. In some subjects, disorders associated with dose can take place within 3-6 months, while in others health issues may go undetected for years.

It is disturbing to review what happens in rats when they consume a only 10 milligrams Aspartame. Since the dose given was 10 mg, only 10.5 % corresponded to methanol (i.e. 1 mg), 1/1000th of the dose given was just 1 µg, which means that 0.1% of the dose per gram of tissue was equivalent to 1 µg of methanol/ formic acid/ formaldehyde (= 31 mmol = 1 ppm). Liver, thus, contained between 1 and 3.7 ppm of label, while plasma and kidneys maintained very stable levels of about 2 ppm, following administration of a single dose. Chronic administration of aspartame (NC group) resulted in a higher yield of label after the last administration, as observed when comparing the data for 6 hours, ranging from 130-140 % of the value obtained in the single NA group. A fairly conservative estimate may indicate that the daily incorporation of aspartame carbon was in the range between 2-4 ppm for liver tissue, i.e. after 11 days the accumulation may be up to 30 ppm. Since the dose given was 10 mg, of which a 10.5% corresponded to methanol (i.e. 1 mg), 1/1000th of the dose given was just 1 µg, which means that 0.1% of the dose per gram of tissue was equivalent to 1 µg of methanol/formic acid/ formaldehyde (= 31 mmol = 1 ppm). Liver, thus, contained between 1 and 3.7 ppm of label, while plasma and kidneys maintained very stable levels of about 2 ppm, following administration of a single dose. Chronic administration of aspartame (NC group) resulted in a higher yield of label after the last administration, as observed when comparing the data for 6 hours,

ranging from 130-140% of the value obtained in the single NA group. A fairly conservative estimate may indicate that the daily incorporation of aspartame carbon was in the range between 2-4 ppm for liver tissue, i.e. after 11 days the accumulation may be up to 30 ppm. Compare the upper tolerable limits of a recommended trace mineral, fluoride to aspartame, which is neither essential nor beneficial in human cellular metabolism:

EXAMPLE: Fluoride is a recommended anti-cavity and anti-osteoporotic mineral, and if fluoride in the drinking water is greater than 0.6 part per million, additional fluoride is not recommended. For calculation purposes, 1.1 milligrams of sodium fluoride is equivalent to 0.5 milligram fluoride because it comprises approximately 45% of sodium fluoride. The Food and Nutrition Board of the Institute of Medicine has recommended a tolerable upper limits (UL) dose not to exceed 10 mg/day for fluoride. It is alarming that the daily consumption of 2-4 ppm aspartame accumulation resulted in over 30 ppm aspartame carbon metabolites in liver tissue after only 11 days dose.

Evidence that demands a verdict

Further evidence is presented in easily understood terms by careful review of the DVD, "Sweet Misery". This DVD presents evidence that demands reconsideration of the harm aspartame generates from chronic use or acute dose. I no longer consider arguments that some subjects can metabolize aspartame without compromised health issues. Health issues associated with aspartame consumption will occur as a property of dose, time, and genetic individual biochemistry. Evaluation of the information in this DVD warrants a verdict to NOT consume aspartame or synthetic sweeteners.

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From the Saddle of Steve Born

From the office of Steve Born

Bike close-up / Photo - Matt Wingate



Welcome to Endurance News #57, the first issue of 2008! I can honestly say, especially in regards to my travel schedule, that 2007 was my busiest

year ever in the nearly eight years of employment at Hammer Nutrition. Now, for some people, having a seemingly non-stop year may begin the slow (or not-so-slow) progression towards burnout. However, that's not the case here... I am so eager for what lies ahead in 2008; I can't wait, in fact!

Perhaps it's my ultra cycling experiences that are responsible for this. You see, near the end of pretty much every race I've done, I distinctly remember telling myself, "What are you, nuts? Don't you ever, ever, EVER do anything like this again!" And yet, when I reached the finish line it seemed that the pain and misery I might have suffered during at least a portion of these very lengthy races quickly dissolved amidst the joy of finishing and the overwhelmingly positive feeling of accomplishing something pretty monumental. Perhaps that's why I kept coming back and did, among many other ridiculously difficult events, five Races Across America and three Furnace Creek 508's, one of which was a double crossing of the race route.

The point I'm trying to make is that even though I admittedly get tired of being in airports and on airplanes for extended periods of time (or, in the case of one trip, where I spent the night on the floor of the Salt Lake City hotel, thanks to

my flight being cancelled), I still look forward to attending lots of events. Why? Because the unpleasantness that oftentimes comes with travel to and from these events is quickly forgotten when I reflect on how much I enjoyed meeting and talking with the athletes, and how much I enjoy promoting the Hammer Nutrition products.

And the same thing is true in my daily job/tasks here at Hammer. One might think that doing somewhat the same thing daily, year after year, may grow old after awhile; however, I can't really say that's been the case for me. The two reasons for that are:

- 1) The world of nutrition and supplementation is never stagnant; it's constantly changing. That's the reason why I remain enthusiastically enamored with reading about this subject... I learn something new on a seemingly daily basis. In fact, my wife likes to kid me because of how excited I get when I receive the latest issue of one of the supplement research magazines I subscribe to in the mail. That's not to say that I don't have other interests; I most certainly do. Still, I've been a "supplement information junkie" for a long, long time, and even after all these years my enthusiasm in this field hasn't diminished. And because the supplement "world" is constantly changing, quite frankly I don't see my enthusiasm diminishing for a long time, if ever.

- 2) I never get tired of hearing about an athlete who has benefited from the products or advice that we at Hammer Nutrition provide. A saying that I'm well-known for is, "I derive as much pleasure helping other people reach their goals as I do my own; it's the best part of the job." Yeah, I know that may

sound "all warm and fuzzy" but it really is true. Being able to share with athletes the knowledge I've acquired, and just as importantly, the experiences I've had over the years, and receiving feedback from athletes telling me that my input helped them achieve their goal(s) is pretty darn satisfying... how could I ever get tired of that?

The point is that I flat-out love what I do here at Hammer Nutrition, and I hope to be able to continue to do that for many, many years to come. For now, I am so focused on 2008 and in helping you reach your athletic and health goals... I'm really eager to work with you! No, I may not like airports, airplanes, or the "flying experience" in general, but if that's the worst thing I have to deal with in regards to my job responsibilities, I've got it pretty darn good!

Special "shout out"

After the last issue, where I gave props to John Spurgeon, the first and only person to complete RAAM on a single speed bike, I thought I'd continue that trend (giving special props to a particular athlete) in my column for future issues of EN. With that said, I want to congratulate my friend, Stephen Brown of Pennsylvania. Stephen is a USAT Mid-Atlantic Regional board member, the editor of TransitionTimes.com, the multi-sport editor for Liberty Sports magazine, and a coach for many aspiring triathletes. However, as impressive as all those jobs/titles are, what impresses me most about Stephen is his remarkable spirit, determination, and physical toughness. Back on February 24th, 2006, Stephen was diagnosed with chronic lymphocytic

see STEVE on page 5

STEVE from page 4

leukemia. However, instead of giving up in defeat to the not-promising prognosis, Stephen "fought fire with fire," so to speak, by going through the treatments and getting back into training. We featured this remarkable show of courage in the article "Remission Man" in EN#53, and if you haven't read it yet, please do so... I know you'll be inspired. You'll find the article on the Hammer Nutrition website in the Endurance News link.

Stephen hasn't slowed down a bit-if anything, he's more active than ever-and prior to my departure for Australia and New Zealand, he sent me the following email: "Just wanted to let you know that, with the help of Hammer Nutrition, I notched career Ironman number 9 into my belt last weekend at the ChesapeakeMan Ultra Distance Tri. Thanks for all you do."

I don't know about you, but if/when I ever need a morale booster, all I need to do is reflect on the determination of this athlete, my friend, and his stubbornness to not throw in the towel after being diagnosed with this disease. His book, *My New Race*, chronicles his journey through remission and back into the competitive ranks, and a portion of all the sales benefit the Leukemia & Lymphoma Society. You can find out more about the book and this remarkable person at RemissionMan.com.

A special "shout out" and a mighty congratulations to you, Stephen, on the completion of your ninth iron distance race, and may 2008 be an even greater year for you!

Fueling-keep it simple and reap the rewards!

In mid-October 2007, I returned to the States after a fairly lengthy speaking tour throughout Australia and New Zealand. And what a great trip it was, having the opportunity to meet many athletes and talk with them about fueling and other athletic-specific topics. One of the things I'll always remember from that trip-and this is, of course, true in my experiences with American athletes as well-is the feedback I received, most of which was something to the effect of: "Fueling used to be such a mystery to me, but the way

you've explained it has really taken the guesswork out of it. It's just not as hard as I thought it had to be!"

Now, I'm not going to claim credit for the fueling recommendations we make (I'm simply a messenger), but I will say that it's really great to receive this type of feedback from athletes after one of my seminars, and especially after they've had a chance to implement these recommendations in their workouts and races. What it boils down to is that fueling really doesn't have to be a mystery; it's actually pretty easy to get it dialed in. All it takes (paraphrasing



what Brian wrote in his column from the last edition of EN) is a minor investment of your time and a pivotal change in your approach to fueling.

When it comes to fueling your body during exercise, you need to first and foremost keep the following in mind:

A) Your body is an amazingly designed machine, with an incredible number of remarkably complex and efficient mechanisms, all working synergistically, that are a built-in part of it.

B) Via these built-in mechanisms, your body absolutely knows how to take care of itself in a crisis/survival situation; its first instinct is survival. And yes, when you start exercising, your body definitely goes into "survival mode."

If you keep those things in mind and fuel your body in deference to the wonderfully designed mechanism that

it is, it can't help but respond favorably and keep doing what you want it to do. Sure, it's interesting to know about such things as how many calories you're burning and how many grams of salt you may be losing. However, while those data might factor into the equation, they really aren't that significant when it comes to fueling during exercise. What takes priority at that time is not what you're losing in terms of calories, fluids, and electrolytes, but how much your body can comfortably accept in return from you and your fuel donation. In other words, if your body is going to keep doing what you want it to do, yes, it needs some fueling assistance. You need to give your body a helping hand, but you do not want to kill it with kindness. As Dr. Bill says, "When we try too hard to help ourselves, we end up doing more harm than good."

We keep bringing up the "less is best" method of fueling because it is the right way to fuel, simple as that. When you put calories, fluids, and electrolytes back into your body, your focus needs to be on what it is capable of accepting in replenishment, not what it's losing. And you know what? When you adopt the "less is best" approach to fueling, you not only see better results, you make things a whole lot simpler for yourself. As you begin your season this year, make a commitment to keep things simple when it comes to fueling. Take the mystery out of it by working in cooperation with your body, not against it. Then, take notice of how good you feel and how your performance has vastly improved as a result. You'll be stoked!

Remember, we are here to assist you with your fueling and supplement program. Our goal is to help you achieve your athletic and health goals... we're but a phone call or email away if you need us!

Have a great 2008!

HOT TIPS

Freeze your fish oil

If you're taking fish oil supplements, such as the Carlson Norwegian Salmon Oil sold by Hammer Nutrition, you may have experienced an unpleasant fishy aftertaste. If so, store the bottle in the freezer. This will minimize or even eliminate the fish oil taste.

HFCS from page 1

We analyzed food consumption patterns by using US Department of Agriculture food consumption tables from 1967 to 2000. The consumption of HFCS increased greater than 1000% between 1970-1990, far exceeding the changes in intake of any other food or food group. HFCS now represents greater than 40% of caloric sweeteners added to foods and beverages and is the sole caloric sweetener in soft drinks in the United States. Our most conservative estimate of the consumption of HFCS indicates a daily average of 132 kcal for all Americans aged above 2 years, and the top 20% of consumers of caloric sweeteners ingest 316 kcal from HFCS/day. The increased use of HFCS in the United States mirrors the rapid increase in obesity. The digestion, absorption, and metabolism of fructose differ from those of glucose. Hepatic metabolism of fructose favors de novo lipogenesis [ed: fat deposition]. In addition, unlike glucose, fructose does not stimulate insulin secretion or enhance leptin production. Because insulin and leptin act as key afferent signals in the regulation of food intake and body weight, this suggests that dietary fructose may contribute to increased energy intake and weight gain. Furthermore, calorically sweetened beverages may enhance caloric overconsumption. Thus, the increase in consumption of HFCS has a temporal relation to the epidemic of obesity, and the overconsumption of HFCS in calorically sweetened beverages may play a role in the epidemic of obesity.

Specific Comments Against Myths About HFCS

Myth: HFCS, fructose, and corn syrup are the same.

To provide a common frame of reference for the terms used in this paper, the following definitions should be understood. Sugar is any free monosaccharide or disaccharide present in a food. Sugars includes at least one sugar; composite sugars refers to the aggregate of all forms of sugars in a food and is thus distinguishable from specific types of sugar, such as fructose, glucose, or sucrose. Added sugar is sugar added

to a food and includes sweeteners such as sucrose, HFCS, honey, molasses, and other syrups. Naturally occurring sugar is sugar occurring in food and not added in processing, preparation, or at the table. Total sugars represents the total amount of sugars present in a food



and includes both naturally occurring and added sugars. Free fructose is fructose that exists in food as the monosaccharide. Fructose refers to both the free and bound forms of fructose... HFCS made by enzymatic isomerization of glucose to fructose was introduced as HFCS-42 (42% FRUCTOSE) and HFCS-55 (55% FRUCTOSE) in 1967 and 1977, respectively, and opened a new frontier for the sweetener and soft drink industries. Using a glucose isomerase, the starch in corn can be efficiently converted to glucose and then to various amounts of fructose. The hydrolysis of sucrose produces a 50:50 molar mixture of fructose and glucose. The development of these inexpensive, sweet corn-based syrups made it profitable to replace sucrose (sugar) and simple sugars with HFCS in our diet, and they now represent 40% of all added caloric sweeteners. Fructose is sweeter than sucrose. In comparative studies

of sweetness, in which the sweetness of sucrose was set at 100, fructose had a sweetness of 173 and glucose had a sweetness of 74. If the values noted above are applied, HFCS-42 would be 1.16 times as sweet as sucrose, and HFCS-55 would be 1.28 times as sweet as sucrose. This contrasts with the estimates reported by Hanover and White. In their study, the sweetness of sucrose was set at 100. Fructose, however, had a sweetness of only 117, whereas a 50:50 mixture of fructose and sucrose had a sweetness of 128. It is difficult to see why fructose and sucrose combined would be sweeter than either one alone and as sweet as HFCS-55.

Myth: HFCS accounts for only about 10% of the world's sweetener.

HFCS now represents greater than 40% of caloric sweeteners added to foods and beverages and is the sole caloric sweetener in soft drinks in the United States [italics ours]. Our most conservative estimate of the consumption of HFCS indicates a daily average of 132 kcal for all Americans aged ≥ 2 y, and the top 20% of consumers of caloric sweeteners ingest 316 kcal from HFCS/d. The increased use of HFCS in the United States mirrors the rapid increase in obesity.

Myth: Your body can't tell the difference between HFCS and other sugars.

The digestion, absorption, and metabolism of fructose differ from those of glucose [italics ours]. Hepatic metabolism of fructose favors de novo lipogenesis. In addition, unlike glucose, fructose does not stimulate insulin secretion or enhance leptin production. Because insulin and leptin act as key afferent signals in the regulation of food intake and body weight, this suggests that dietary fructose may contribute to increased energy intake and weight gain. Furthermore, calorically sweetened beverages may enhance caloric overconsumption. Thus, the increase in consumption of HFCS has a temporal relation to the epidemic of obesity, and the overconsumption of HFCS in

see HFCS on page 7

HFCS from page 6

calorically sweetened beverages may play a role in the epidemic of obesity.

References

1. John S. White and John P. Foreyt, 2006. Ten Myths About High-Fructose Corn Syrup. Food Technology 60:10.

http://www.members.ift.org/IFT/Pubs/FoodTechnology/Archives/ft_1006.htm; requires membership.

2. George A Bray, Samara Joy Nielsen and Barry M Popkin, 2004. Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. Am J Clin Nutr 79:4 537-543. Online at <http://www.ajcn.org/cgi/content/full/79/4/537>

Steve's comment:

I am convinced that you will hear, via various media sources, an ever-increasing amount of "evidence" suggesting that HFCS is not the "bad guy" we all think it is. Don't believe a word of it. This article, along with the following articles, are all available on the Hammer Nutrition website.

- Dietary Fructose or Fructose Containing Sweeteners Negatively Impacting Health
- Fructose (corn syrup) is No Answer For a Sweetener
- Fructose Increases the Rate of Aging
- Fructose Sweeteners Negatively Impact Blood Sugar and Lipid Metabolism Inhibiting Energy Production

These articles provide more than enough evidence that it's in your best interest, both athletically speaking and for general health reasons, to avoid food products containing HFCS.



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Brian Frank

Perpetual growth requires a steady and proportionate increase in staff. For the first time ever in this publication, we are printing a "want ad" of sorts. If after reading this, you feel that you or someone you know well would be a good fit, we'd like to hear from you.

We are looking for a very unique person to fill this position, the proverbial needle in the haystack for sure. They need to be a "people person" who has unusual excellence in communicating with a large community of athletes and a broad knowledge of our products and the sports we are most active in; triathlon, cycling, ultra cycling, mtb racing, 24 hour endurance races, ultra running, etc. Not to mention the athletes, both amateur and professional, who are excelling in each of these sports.

This is a full time position that requires relocating to Whitefish, Montana and will involve a lot of travel, even extended periods on the road in a motor home,

pulling our expo trailer from event to event and visiting shops, doing clinics, and meeting with sponsored athletes along the way. The person who fills this position can and should be an active competitor. The job will allow ample time for training. However, they must be willing to allow their roles in sponsorship and event promotion to take precedence over their race schedule. Sometimes you will need to run an expo instead of racing the event.

Due to the relocation requirement and the extensive travel, an athlete who is single without firm roots in their current location will likely find it much easier to fill this position. Wages will be fair and negotiable. Benefits and potential for advancement are extensive.

If this sounds like your dream job, send a letter explaining why you'd be the perfect person for this position, along with a current resume to jobs@hammernutrition.com.

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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 Hammer Nutrition 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 are available at www.hammernutrition.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.

PRODUCT SPOTLIGHT

Race Caps Supreme

Enhancing athletic performance and overall health since 1987!

Steve Born



As many of you know, I've been involved in the health food/supplement industry for nearly two decades, and I can tell you from firsthand experience that the supplement offerings available to us athletes are at an all-time high. I thought I had a pretty good handle on things in regards to keeping up on new supplements, but I'll be darned if it doesn't seem like there's a new one coming out every week.

And you can believe me when I tell you that after trying literally hundreds of supplements over the years in the hopes of finding a product that would effectively, yet safely, enhance my athletic performance, I know firsthand how frustrating it can be to spend hard-earned money on a supplement, only to find that it didn't deliver anything close to the promises attached to it. Even though most of my "trial and error" purchases were quite awhile ago, I still sometimes find myself sighing, "Geez, what a waste... all that money down the drain!"

However, if there's a silver lining to my years of costly supplement "experiments," it's that you don't have to go through the same thing. That's because, of all the supplements I've ever tested, only a handful remain in my arsenal, and one of those is Race Caps Supreme. I've been using it (and its predecessor, Race Caps) since the early 90's, long before I started working for Hammer Nutrition, so don't discount what I have to say about this product.

Truth is, Race Caps Supreme is one of the very few products I have come across that provides dynamic benefits for both athletic performance enhancement and overall health. That's important to me, and it should be to you, too. If a

supplement that's touted as an ergogenic aid doesn't have applications for general health as well, it's not one I want to put a lot of faith in, and it's not worth my hard-earned money. What I mean is that the nutrients contained in a product must work safely with the body, not in a manner that overrides or interferes with normal body functions. If a product is truly beneficial, it's going to work in cooperation with the body, which means it's going to have general health benefits as well as athletic performance benefits.

Race Caps Supreme does work in cooperation with the body, providing profound benefits for both athletic performance and overall health. In regards to the athletic performance benefits, here's what you can expect from consistent use of Race Caps Supreme:

- Higher energy levels, both in your training and all day long, but without the unpleasant stimulant side effects that come from the ingredients in so many other supplements
- Noticeable increase in endurance
- Less muscle soreness and enhanced recovery from all your tough workouts

In addition to those benefits, Race Caps Supreme offers some tremendous benefits for your overall health as well:

- Antioxidant support for maximizing optimal immune system functioning
- Key nutrients optimizing cardiovascular system health
- Powerful nutrient support to aid in the prevention of many types of cancers and degenerative diseases

Simply put, there is no other athlete-specific supplement available that can

provide the range of benefits that Race Caps Supreme can, both for enhancing athletic performance and overall health. It has unquestionably made a difference in my athletic career, and it's changed the lives of thousands of athletes, helping them to achieve more productive workouts and better race results while also helping to improve their overall health and quality of life. Those results aren't restricted to the "young gun" athletes only; in fact, a tremendous number of Master athletes who use Race Caps Supreme are continuing to enjoy top-level performances while also enjoying superior health. Here are but a few of the many testimonials we've received from these older-yet-better athletes:

"I raced the Mohican 100, the opening round of the National MTB Ultra Endurance series, earning second place in the Master's 50+ category. During my 12+ hours on the bike I used 100% Hammer Nutrition products to keep me fueled. In addition to my Perpetuem/ Hammer Gel mix I took hourly doses of Race Caps Supreme." - Stephen K.

"I have used Race Caps Supreme since its introduction during both training days and on off days. Taking Race Caps Supreme prior to and during my workouts noticeably reduces muscle fatigue and increases my endurance. I also find that it gives me a lactic acid buffering effect during the intensity parts of my workout. On off days I use Race Caps Supreme to enhance recovery. Team Hammer Nutrition also uses Race Caps Supreme and it's obvious that it helps them as well, as evidenced by our results in the District TT Championships: Bob Brook 65-69 age group champion; Jim Fox 60-64 age group champion." - Mike F.

see RCS on page 9

RCS from page 8

"Nineteen years ago I began using Race Caps (now called Race Caps Supreme) and have been using them continuously since then. In that time I have completed over 100 triathlons, including four iron distance events, and numerous marathons and ultra endurance bike events. Now, at age 62 my all time marathon PR is less than two years old. Last week I rode within a few seconds of my all time best ever cycling time trial, and I completed my most challenging Iron event, the Silverman Triathlon, all while using Race Caps Supreme. I am now often winning my age group at events and having the time of my life. I'm just not slowing down as most do with increasing age; actually, I'm still improving in all disciplines and I believe Race Caps Supreme has played a significant role in that. I'm certainly not planning on slowing down and I intend to keep using Race Caps Supreme to help maintain my health and vitality." - Bill N.

The tremendous volume of solid, science-based research that defines and supports the formula and the overwhelming positive feedback we've received from literally thousands of satisfied clients over the past 20 years clearly indicate that Race Caps Supreme has no equal. It is THE supplement you'll want to start taking right away and stay on for life. Unlike the "here today, gone tomorrow" products that advertise plenty but deliver little, we guarantee you will receive exactly the results we promise.

The Race Caps Supreme Formula Profoundly enhancing your athletic performance and overall health

Coenzyme Q10 (CoQ10, also known as ubiquinone) - In each of the billions of cells in your body are hundreds to thousands of energy producing "furnaces" called mitochondria. Through an intricate and complex process called cellular respiration, they produce the majority of your body's adenosine triphosphate (ATP), the "universal energy currency." All living organisms, plant and animal, use ATP to transport energy. The production of ATP within the mitochondria involves two phases of metabolic processes: the tricarboxylic acid (TCA) cycle, also called the Krebs cycle or citric acid cycle, and a sequence of steps called the electron transport chain (ETC). The electron transport

chain is where a process called oxidative phosphorylation occurs that actually produces most of the ATP molecules. No need to go into all the fascinating details here; suffice it for now to say that CoQ10, one of the two main components in Race Caps Supreme, is a vital primary substrate involved in this process. Its importance cannot be understated; without CoQ10 the chain of cellular energy production is broken. Needless to say, CoQ10 is a crucially important nutrient (a "spark plug," if you will) for the efficient production of energy from your food and oxygen intake. Exercise rapidly depletes these important nutrients, so taking Race Caps Supreme is like putting fresh spark plugs into your body, ensuring consistent, efficient energy production. This translates into higher energy levels, increased endurance, and improved recovery.

CoQ10's importance goes way beyond athletic performance enhancement, however, with one nutrition expert bluntly stating, "Without CoQ10, or a good substitute, human life quickly ends." Thus, CoQ10's role in maintaining clean and efficient energy production is obviously crucial for maintaining optimal health, especially in regards to cardiovascular and brain health and strong immunity. When it comes to cardiovascular health, one well-known cardiologist is quoted as saying, "I have long considered CoQ10 a wonder nutrient because of its ability to support heart health." In addition, CoQ10 has numerous other benefits, including helping to lower blood pressure, aiding in the prevention of many forms of cancer, and playing a potentially key role in the prevention of Parkinson's disease. It even helps promote healthy teeth and gums, and supports healthy skin by providing protection against UV radiation. Wonder nutrient indeed!



Mike Engleman used the first incarnation of Race Caps Supreme way back in 1987. Here he is at the Coors Classic in August of 1987.

As we age, both our endogenous (naturally produced by our body) supply of CoQ10 and our ability to synthesize this nutrient from our food diminishes. In fact, research has shown that CoQ10 levels in humans peak at around the age of 20, declining with every passing year. It is believed that by the age of 40, the body has 40% less CoQ10 than at age 20, and 60% less at age 70. In fact, it is estimated that as many as 75% of people over age 50 in the United States could be deficient in CoQ10. The body's need for CoQ10 never diminishes, however, which makes supplementation absolutely essential; it is the only way to maintain and restore adequate levels of this vital nutrient.

Bottom line: For both athletic performance and general health applications, there is simply no question

that supplementing with CoQ10 is an extremely wise strategy. For athletes (all people, actually) in their 30's and older, supplementation with CoQ10 isn't just a good idea, it's essential!

Hammer Nutrition was the first company to introduce CoQ10 to athletes, and we did it long before its athletic performance and general health benefits became well known. Twenty years later, with CoQ10-and now idebenone (see below)-as the cornerstones of the Race Caps Supreme formula, Hammer Nutrition continues to lead the way in producing unique athletic and health benefiting supplements. (For more information on this all-important nutrient, please see the article "Coenzyme Q10 Impacts Health and Aerobic Metabolism" at www.hammernutrition.com/downloads/coq10.pdf)

Idebenone is an analogue of CoQ10 (the "good substitute" mentioned earlier) and the other primary ETC component in the Race Caps Supreme formula. A superb complement to CoQ10, some experts

see RCS on page 10

RCS from page 9

suggest it may be even more powerful than CoQ10. Dr. Bill Misner explains, "Idebenone supplies all of the same benefits as CoQ10 [acting as a "spark plug" for the production of energy (ATP) as well as being a potent antioxidant] plus some distinct advantages based on its more complex chemical structure."

While CoQ10 is perhaps the most important substance one can take for the prevention of cardiovascular disease and certain cancers, idebenone also provides superb nutritional support in those specific areas, while appearing to have even greater brain-specific benefits. Dr. Misner writes, "Idebenone protects the brain from the detrimental effects of serotonin deficiency and facilitates endogenous serotonin production. Serotonin deficiency compromises sleep and may contribute to chronic depression. Idebenone favorably affects blood flow in the brain, reproducing verbal fluency, creativity, and memory. Idebenone enhances endogenous norepinephrine production by facilitating cellular uptake of tyrosine. This suggests that idebenone may indirectly improve the uptake and reproductive role of tyrosine in thyroid hormone production. Thyroid hormone deficiency is a factor in performance and body mass index."

Other "brain benefits" attributed to idebenone include improved cognition and mood, reduced damage from Parkinson's disease and Alzheimer's disease, and a role in the prevention of damage caused by excitotoxins (a class of substances produced from the consumption of substances such as MSG and some artificial sweeteners) which can impair neuronal functioning. On top of that, idebenone appears to positively affect liver mitochondrial function, which suggests that it would support and enhance the detoxification functions of the liver (NOTE: Another notable "liver health" nutrient is r-alpha lipoic acid, which is in Mito Caps).

Perhaps the most remarkable feature of idebenone is its unique ability to operate under hypoxic (low oxygen) conditions, helping to produce energy and maintain high energy levels without creating free radicals. In other words, under the same cellular low oxygen conditions that can cause CoQ10 to act as a pro-oxidant, idebenone helps prevent free radical

damage while still supporting ATP production.

Why both CoQ10 and Idebenone? If idebenone is supposedly a "better CoQ10," then why do we put both nutrients in Race Caps Supreme? I mentioned one reason earlier: while they are similar in chemical structure and provide some similar benefits, each nutrient also has its own specific benefits. Additionally, there's a synergistic process between them, as they enhance each other's effectiveness. Dr. Bill writes, "When idebenone is taken with Coenzyme Q10, each potentiates the other by a factor of nearly 10X." Dr. Bill further states, "Add to this the special antioxidant and performance-associated properties of vitamin E, trimethylglycine (TMG), and inosine (all three discussed later), the dosage from coenzyme Q10 and its ubiquinone synthetic, idebenone, is easily equivalent to a 300-400 mg dose of what each generates when taken alone."

Bottom line: Like CoQ10, idebenone provides a multitude of benefits that go well beyond athletic performance enhancement. Most sports nutrition companies have likely never even heard of idebenone, let alone know what it does, but Hammer Nutrition has provided this potent and highly beneficial nutrient to athletes for years. Not available in any endurance athlete-specific supplement, with Race Caps Supreme, you have the power of idebenone available to you.

If only because of the CoQ10 and idebenone components, Race Caps Supreme blows the doors off any other athlete-specific supplement, both in terms of athletic performance enhancement and overall health benefits. But there's a lot more to the Race Caps Supreme formula; a lot more...

Other powerfully beneficial components in the Race Caps Supreme formula

Vitamin E - The problem with energy production is that it's not a completely "clean" process; a naturally occurring and unavoidable metabolic by-product is the production of free radicals that can cause tissue and cellular damage. That's precisely why vitamin E, while not directly involved in the cellular respiration process, is a vital component in the Race Caps Supreme formula.

Vitamin E is a powerful antioxidant that, along with CoQ10 and idebenone, helps neutralize the free radicals naturally produced during energy production. Vitamin E has numerous general health benefits as well, especially in the areas of cardiovascular and circulatory system health.

Race Caps Supreme contains vitamin E in the easily assimilated succinate form, so not only do you receive the multiple benefits of vitamin E, the succinate component provides a key substrate for Krebs cycle energy production.

Oxy-Assist - This is a precise blend of the three nutrients that provide benefits for enhancing oxygen utilization, optimizing fats-for-fuels capabilities, and for providing additional support for energy production and acid buffering:

- **Trimethylglycine (TMG)** - This nutrient helps with the utilization of fatty acids for energy production, has been used to treat muscular weakness and degeneration, is a powerful antioxidant, and primarily acts as a methyl donor, enhancing the transport of oxygen to muscle tissues. TMG is also noted for its beneficial effects at helping lower elevated levels of homocysteine, which is implicated in cardiovascular disease.
- **Inosine** - Of the many roles this nutrient plays in the body, one of which is in the production of ATP, inosine helps increase the oxygen-carrying capacity of the blood, allowing more oxygen to be delivered to the muscles, thereby reducing fatigue.
- **Glycerol phosphate** - Used in the muscle mitochondrial cells for the production of energy, phosphates are also beneficial for buffering excess acidity.

Krebs cycle intermediates - Earlier I mentioned that Race Caps Supreme's CoQ10/Idebenone combination fulfilled a major component for the ETC. For supporting the TCA cycle, the Race Caps Supreme formula supplies a precise amount of the Krebs cycle intermediates malate, citrate, aspartate, lysinate, glycinate, which are chelators for the minerals calcium, magnesium, and potassium. Another Krebs cycle intermediate, alpha ketoglutarate, is

see RCS on page 11

RCS from page 10

included as well.

Digestive aids - Hammer Nutrition takes seriously the oft-used saying, "It's not how much you eat, it's how much you absorb." If your body doesn't absorb adequate amounts of the nutrients-no matter how good they may be or how much we include in the formula-you won't receive all the benefits that you should. To ensure maximum nutrient absorption, Race Caps Supreme contains a potent blend of various digestive aids. One of these is a proprietary formula called the Enzyme Enhancement System(tm), which consists of no less than eight digestive enzymes, and the other is the well-researched standardized black pepper extract Bioperine(tm). The latter is of particular interest because it has been shown in reliable research to enhance the absorption rate of important nutrients such as CoQ10 by over 30%. That's huge!

Bottom line: Race Caps Supreme, in addition to its main components, CoQ10 and idebenone, contains key auxiliary components to complement those two powerhouse nutrients, while providing specific benefits of their own. Race Caps Supreme also supplies a variety of digestive aids to ensure you get the most out of the product, allowing you to receive maximal benefits. The combination of nutrients in Race Caps Supreme works synergistically to provide you with numerous athletic and general health benefits, unmatched by any other athlete-specific supplement.

Summary

Many athletes consider supplements unnecessary and a waste of time and money. Given the overwhelming number of products that over-promise and under-deliver, that's an understandable position. Add to that the lack of technical support and knowledge resources for these products (not that their ingredients have much to talk about anyway), ridiculous prices, and little or no tangible results from using them, and it's no wonder many athletes completely give up on any supplement program.

The truth, however, is that the consistent use of the right supplements can make a tremendous impact on your athletic

performance while also making a hugely positive contribution to your overall health. Race Caps Supreme is one of "right" supplements; for 20 years it's been delivering the results we claim it will. If it didn't, it would have long ago fallen into the countless "here today, gone tomorrow" category of supplements that have littered (and continue to litter) many an athlete's cupboard. Race Caps Supreme's longevity in the world of endurance supplements has no equal, and its popularity among serious endurance athletes continues to grow dramatically. Athletes who try Race Caps Supreme stay on Race Caps Supreme. Why? Because the product works!

Race Caps Supreme works powerfully and synergistically to cover a wide range of requirements for maintaining consistent, efficient energy production. Perhaps even more impressive is the overall health benefits derived from the consistent use of this unique product. You will not find an endurance-specific supplement at any price that can match Race Caps Supreme, both in terms of athletic performance enhancement and general health benefits... we guarantee it.

If you have yet to try Race Caps Supreme, now as the 2008 season begins is the perfect time to give it a thorough test in your training. Start experiencing, and continue to enjoy, the dynamic results-both athletic performance-wise and overall health-wise-that you've been looking for. Unlike

the other supplements you may have tried, you won't be disappointed with the investment you make in Race Caps Supreme! Remember, as with all of our products we assume the monetary risk of your trial. If Race Caps fails to deliver as promised, we will refund your purchase price. That's our guarantee to you.

"I ran out of Race Caps Supreme and my run workouts stunk for three days until I got a new supply! I don't need any more confirmation than that." - Molly G.

"I used Race Caps Supreme during a long ride for the first time this past weekend... holy cow, they worked awesome. I'm usually pretty spent at 2.5 hrs but I had very little fatigue at the 3-hour mark when I hit my last two climbs. Then Sunday I did a 13-mile run 3 minutes faster than last weekend (that's approx 15 sec/mile)!" - Lou O.

"I used Race Caps Supreme all season. [They] definitely seem to help overall performance and recovery. I can notice a difference in how my body feels the next morning after hard workout days." - Mike B.

"I have used Race Caps Supreme as part of my training/racing foundation. I feel Race Caps Supreme has helped me become a stronger competitor and 7 State titles and many local race wins will back this up." - Greg D.



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Jim Bruskewitz

It's a New Year and a new season. Enough of the holiday meals and checking off lists, we've turned our gaze toward reaching our athletic potential this year. No matter what kind of season(s) we've had, we can't help but imagine what could be if everything fell into place. We imagine this because we never have a perfect season; there's always something that could have gone a wee bit better for us. What would that be like? We don't know. Those dreams that beget our goals come when we imagine what we could do, not what we've done. We're all trying to go someplace that we think others have been, but we haven't—at least not yet. We can reach these goals, but if we are going somewhere we've never been before, then it would certainly help to get some directions. A map would be nice. This map we follow should be like any roadmap. We need a starting point, a final destination, and some specific landmarks along the way to make sure we're staying on course. Rather than trying to find our way without direction, now is the time to make the map.

If the map accurately directs us, it better be wrought from sound training principles. It better be a map that we have the ability to follow. Any training plan that works promotes consistency in training. The cumulative effect of the training bouts over time will determine whether we've gained the fitness we know we need. A weekly schedule of workouts should be planned in such a way that we know we can complete them and still have something in our tank to take the next step. A reasonable training protocol that allows our bodies to adapt to regular exercise is the start we need. That should be the first landmark on our map. Let's give our bodies a few weeks to reach that point.

The next point of interest along the way should be an increased base of aerobic fitness. A mix of workouts weighted toward longer efforts at a fairly light intensity, below our anaerobic threshold, will occupy most of our time training. This is the training level that allows for conversation. Sprinkled into this mix are shorter efforts up to an intensity that feels hard. We can still talk, but the sentences are getting quite short.

Weight training is appropriate at this juncture. Include extra work in those areas that you have identified as "limiters," so you can bring them up to speed before the competitive season. A good way we can improve in a discipline is by adding workouts that are short and not necessarily hard. An extra workout or two per week devoted to a weaker discipline can help. We can check to make sure we are staying on course by measuring our improvement every three to four weeks. We need to give our bodies a chance to absorb the training load and adapt, so looking for improvements more frequently is inappropriate. Since we're working on an aerobic base, our weaker disciplines, and possibly our strength as it relates to a discipline, we should test ourselves in those areas. A repeatable long low intensity time trial can indicate the degree of improvement. Shorter time trials at intensities up to our anaerobic threshold (a hard effort) can give us a bearing on how we're progressing in our weaker discipline(s). Measuring strength in the weight room can be noted by increases in training weight, the number of repetitions, or performing a one-rep maximum to directly measure our strength.

Our map clearly shows a progression in our training load (a combination of duration, intensity, and amount of rest taken within and between workouts).

The aerobic base workouts that occupy well over half of our training time need to challenge us to ever increasing degrees throughout the eight to twelve weeks that we spend in this phase. The perceived exertion should increase from very light to fairly light to somewhat hard as we follow our map. If we are measuring pace while swimming or running, or power output on the bike, these metrics should increase slowly and continually. To avoid depletion and also consolidate the gains we've made while increasing the load, we build for three weeks and then back off, not take off, for a week. The incremental increases serve as more landmarks indicating that we are staying on course.

Wrong turns along the way can take us down a dead-end path. We can gain the most in the next phase of our training, the build or intensity phase, but we stand to lose a good deal, too. Training at and above our anaerobic threshold trains both our aerobic and anaerobic energy delivery abilities because high intensity training stresses both components. Our map should account for the fact that these adaptations do not take as long to develop, and more than six to eight weeks of high-intensity training can lead us to a dead end of overtraining, poor race performances, and injuries. The majority of time spent training should remain aerobic with light recovery sessions. Now we increase the amount of time we spend at higher training intensities, sessions that are hard or very hard. The duration of the training sessions we achieved while building our aerobic base is reduced. If we've been engaged in training and racing for some time, we may be able to include three higher intensity sessions per week. There is no one regimen that is appropriate for all of us. We each bring different levels of fitness and

see JIM on page 13

Primal Quest

Hammer Nutrition sponsors
Primal Quest Montana 2008

Mount Reynolds,
Glacier National Park.
Photo - Angela Nock

Steve Born

We are excited to announce our partnership with the world-class adventure race known as Primal Quest, back after a two-year hiatus. Headed up by retired Navy SEAL and well-known/respected adventure racer and event promoter Don Mann (who's also an avid Hammer Nutrition product user), the 2008 race will take place in Hammer's home state of Montana on June 21 - July 2 (exact location TBA).

Labeled as "The World's Most Difficult Human Endurance Competition" (or, as writer Jason Blevins puts it, "The sufferfest that eclipses all sufferfests"), Primal Quest (quoting their website) "... is a 5-10 day expedition adventure race. It is the largest non-motorized, multi-sport, multi-day event of its kind in the US. Primal Quest(r) is an environmentally friendly, ecologically aware wilderness Expedition Adventure Race(r). Teams of experienced back-country adventure athletes journey across expansive terrain using only a map, a compass, and combined skills. Successfully finishing requires much more than stamina and mental fortitude. It requires selfless teamwork, spirit, and absolute determination. Only co-ed

teams of four are permitted to race. Team members are required to travel together at all times and must finish together in order to be officially ranked. Over \$100,000 in cash and prizes will be awarded to the top finishing teams."

In the most recent newsletter to prospective teams and adventure racing enthusiasts, Don Mann wrote:

Dear Adventurers,

It is my honor and great pleasure to welcome you to Primal Quest Montana, the "World's Most Challenging Human Endurance Competition." In less than 7 months you will gather at the starting line with many of the world's finest adventure racers and set out to compete in an epic adventure. On behalf of the entire Primal Quest Management and Operations Team I want to express just how excited we are for your team to join us in the mountains of the Big Sky State.

Because this year's race is a supported event, it made sense that we should create

a more challenging course than we did with Primal Quest Utah. While the Utah course was demanding with its very hot temperatures (112 -116 degrees at times) and a desert that had a way of draining all energy reserves from the competitors, the Montana course will present new demands on your bodies. Teams will face less harsh weather, but unrelenting climbs on both foot and bike.

In Primal Quest Montana you can expect to climb over 100,000 feet (Everest x 3), you will paddle and swim in big white water and you will perform world-class mountain navigation. The pain and the suffering you will encounter will be made even more rewarding by the never-ending 360 degree vistas of absolutely beautiful, rugged and remote terrain.

Hammer Nutrition is honored to sponsor this epic race. We look forward to welcoming all the teams racing in Primal Quest Montana to our great state! For more information please visit www.ecoprimalquest.com/wp-primal

JIM from page 12

abilities to absorb training loads. Rest time between sessions should increase. Some of the intensity comes from the races themselves. Some landmarks to note along the way are our performances in the races. We cannot expect our best performances every time we race, so race landmarks don't all loom equally large as we follow our map.

We'll be missing a great deal if our map doesn't account for muscle specificity. Our muscles respond specifically to the way we train them. I can increase my squat weight a good deal without improving my vertical leap because

I have not trained at a fast speed of contraction. Our map should take into account the specificity of each discipline's training load, contraction speed, range of motion, and firing pattern. Now that we have six to eight weeks mapped out to make the final preparations for our races, the training should be most specific to what the races we have chosen will demand of us. For this reason, race intensity workouts and coupling the bike and run into one workout are two examples of what should be on our maps.

No two maps will look alike. The road each of us follows should take us to the

improvements each of us individually looks for. Pick up a roadmap of two different states and you will see many similarities, even though all of the destinations differ. Common to all good maps will be training principles such as consistency, incremental progression, use of phases, and adequate timing to prepare for specific events. Enjoy the scenery, but don't lose sight of your destination.

Jim Bruskewitz (ep1@charter.net) coaches triathletes online www.enduranceperformance.com, and is a Lecturer at the University of Wisconsin-Madison's Department of Kinesiology.

Just use your head!

Lowell Greib, MSc ND



Over the course of my career as an athlete, coach and a doctor, I have long been curious as to what differentiates the elite athlete from the weekend warrior. When my colleagues are queried as to their opinion, the traditional response that I receive is that the elite athlete has more potential and trains more. This, theoretically is true, and easy to say, and may even be relatively easy to measure. By simply putting an athlete through a battery of tests that quantify VO₂, lactate threshold, speed, strength, balance, respiratory rate, respiratory quotient and heart rate, sport physiologists should easily be able to pick out those that can excel. Convincing argument... but not always true! Think, for instance, of a pair of identical twins. With the exact same amount of training, eating the exact same foods, over the same amount of time, will they cross the line at the exact same moment? No! Of course not. Logic tells us that they will perform very differently based upon a whole multitude of factors. By taking a step back, and thinking more about external influences that affect individuals, it becomes clear that it is not only physical potential that drives an athlete, but the psyche plays an immense role!

Athletes, in general are a very analytical bunch. They want to see distances, times, heart rates, speeds, weights and cadences associated with everything. On reviewing training logs, it is amazing at how many numbers can be squeezed onto a single page! It is always somewhat surprising that there are no feelings and emotions associated around sleep, training and general well being. All of the “touchy, feely” components are skipped because their value is not recognized. In reality, these emotions are much more complex, biochemically, than a simple depolarization of a muscle that leads to contraction!

There is a fairly significant portion of our brain which is dedicated to the processing of memories, emotions, and feelings. Our limbic system is given the task of processing stimuli, helping store information in memory, affects the autonomic nervous system (including heart rate and blood pressure) and communicates with the hypothalamus and thalamus. The processes of nerve conduction and hormone cascades are, however, not fully understood with regards to this key area of our brain. What we do understand is that the limbic system has the ability to communicate with other regions of the brain in a highly evolved and very complex manner.

Why, as athletes, should we care about the limbic system? For that matter, why as humans should be care about the limbic system? The answer is simply that it affects EVERYTHING you do! For instance, an athlete presents with knee pain of unknown origin. When asked what their complaint is, they reply that their “bum knee” is acting up again. This immediately sends off a warning to a doctor that their limbic system has been adversely affected. Their state of mind and whole perception of the importance of that knee has been changed over the course of time. Their knee (whether left or right), has now become their “bum knee”. As a clinician who recognized the importance of treating the entire athlete, my first intervention is to attempt to change the perception of what that knee is to them. Their limitations, physically, may not be a function of the actual pain in the knee but may be the perception that the knee will not work properly because it is “bum”. Usually before a physical exam I initiate an affirmation with the athlete that will change the perception of what the knee means to the individual. This may be as simple as starting to refer to

the knee as their “right knee” (or left knee as the case may be). When they are questioned by fellow athletes how their “bad knee” is doing, their reply is simply that their “right knee is doing well, getting treated and feeling much better”. By using affirmation, pain perception should decrease considerably. Remember that pain is initiated by feedback from the brain. If perception is changed, so can the feedback to the area of injury.

Now on review of the differences between our athletes in question, it may be a little clearer as to what one of the key features in difference is! Many elite athletes have a different outlook on who they are, and how they perform. They are typically positive, motivated and caring individuals who wish to be around those with similar psychological stature. Whether they are doing this, consciously or unconsciously, it is affecting their limbic system in a positive fashion. Those of us who are not professional athletes need to be very diligent at balancing a vast array of life stressors that may affect our performance. Our attitudes, perceptions, emotions and behaviors in all aspects in life WILL affect our performance as athletes. Because these items are perceptual, we do have the ability to change them and not only positively affect the sport we love, but have the same effects on how we live life in general!

Lowell Greib is a naturopathic doctor and biochemist with an interest and expertise in sport medicine, injury prevention and athletic nutrition. He is the chief medical officer for Mahigan Medicine (www.mahiganmedicine.com) and operates private clinics in Ontario, Canada. Lowell has competed in endurance sport for much of his life and now lends this expertise, clinically, to all athletes from weekend warriors to national team members. To contact Lowell, you can reach him at askthedoc@mahiganmedicine.com or toll-free at 1-877-624-4633.

Multiple Vitamins or Multiple Supplements



Bill Misner, Ph.D.

In a cross-sectional study involving 278 long-term users of multiple dietary supplements, 176 users of a multivitamin/mineral supplement, and 602 non-users of supplements, the users of multiple dietary supplements were found to have better biomarkers of health compared to subjects in the other two groups. At least half of the subjects in the multiple dietary supplements group consumed the following supplements: a multivitamin/mineral, B-complex, vitamin C, carotenoids, vitamin E, calcium with vitamin D, omega-3 fatty acids, flavonoids, lecithin, alfalfa, coenzyme Q10 with resveratrol, glucosamine, and an herbal immune supplement. Most of the women in this group also consumed gamma linolenic acid and a probiotic supplement, while most of the men consumed zinc, garlic, saw palmetto and a soy protein supplement.

After adjusting for various potentially

confounding factors, results clearly showed more favorable health outcomes in the subjects taking multiple dietary supplements. Improvements included lower concentrations of serum homocysteine (while non-users had a 45% risk of elevated homocysteine, and single supplement users had a 37% risk, multi-supplement users had only an 11% risk), C-reactive protein, and triglycerides, and higher levels of HDL cholesterol.

In addition, subjects in the multi-supplement group were found to have lower risks of elevated blood pressure, diabetes (73% less risk of diabetes compared to non-users), and coronary heart disease (52% less risk). Furthermore, subjects taking multiple dietary supplements reported having "good or excellent" health status 74% more often than non-supplement users. Sub-optimal levels of certain micronutrients including vitamin C were found among the non-users and

the single multivitamin/mineral supplement users.

These results suggest that the use of multiple nutritional supplements such as those used by the subjects in this study may confer health benefits. The authors conclude, "These findings should be confirmed by studying the dietary supplement usage patterns, health, and nutritional status of other groups of heavy users of dietary supplements."

Reference

Block G, Jensen CD, et al. Usage patterns, health, and nutritional status of long-term multiple dietary supplement users: a cross-sectional study, *Nutr J*, 2007; 6(1): 30. (Address: Gladys Block, PhD, Professor of Epidemiology and Public Health Nutrition, School of Public Health, University of California, Berkeley, 207-B University Hall, Berkeley, CA 94720-7360, USA. e-mail: gblock@berkeley.edu).

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HOT TIPS

Liquid Endurance and weight control

Because L-carnitine is a crucially important nutrient for maintaining optimal utilization of fatty acids as a fuel source, it naturally assists fat burning mechanics. This is obviously helpful for preventing weight gain during the off-season. However, L-carnitine's "life span" in the body is somewhat short, unless adequate amounts of glycerol are present. That's where the use of Liquid Endurance—which contains both glycerol and L-carnitine—can be a valuable ally for off-season weight control. We suggest one tablespoon in water (approximately 20-25 ounces) taken once or twice daily.



Marni Rakes, M.S.

In recognition of the New Year, you have officially entered the off-season! As a competitive athlete, it's perfectly normal to experience both positive and negative emotions at this time. On the one hand, you're enjoying a little rest, a few sweet treats, and a lot more free time. On the other hand, however, you're missing the fire that burned for triathlons. And sadly, that finely tuned peak-season body . . . where has that gone?

Many of you readers are competitive athletes, and I assume that you're probably ready to start training hard right now in hopes of being conditioned for your first season race. However, I recommend that you avoid structured activity for at least a month after your A-race. If your last race was categorized as endurance, powerful, or strenuous, steer clear of any high-intensity training for at least two weeks. Enjoy an alternative to training such as rollerblading, yoga, aerobics, or treadmill walking (while reading Endurance News). During the off season, it's important to ignore the tendency to train like you did just weeks or months ago. Athletes who race year-round usually switch to another sport to accommodate the change to winter weather. For everyone else, your last A-race is over and done with, and so is your disciplined training routine. While you may feel eager to start training again after your last race, you'll do better if you reward yourself with a physiological and psychological break. Spend a couple weeks to a few months (depending on your racing schedule) exercising just for fun an hour each day. A brief sedentary break is reasonable, but avoid the tendency to cut out all forms of physical activity for more than a week. Although late night TV, eating out, and irregular sleeping habits seem appropriate when

you're not racing, be kind to your mind, body, and soul-keep up your exercise. Don't lay off completely and then hope to scrape it all together next spring.

To recover from joint, muscle, and tissue damage after your exhausting season, mix up your exercise routine. Include a much-needed mental break, and your laid-back exercise routine will present a prime opportunity to start fresh before the next competitive season. Depending on your fitness level and the distance of your major event, you want to allow at least one to two months to build a strong aerobic base prior to anaerobic/lactate competitive training. You can use your off-season "fun-time" activity to help build this base. Whether your activity is planned and structured or effortless and fun, taking part in some type of exercise after your last big race is the best method of preparing for your upcoming season. Exercise doesn't necessarily mean glycogen-depleting, body-pummeling competitive sports. It can mean any activity from dancing to chopping wood. A balanced off-season program for triathletes should include activities ranging from weight training and core exercises (e.g., Pilates) to stretching and yoga, but anything you do to keep you moving will help in some way.

Let's review the sequence of activity, starting from your season finale race. Of course the duration of each "stage" will vary according to your body and specific sport, but the following sequence is your general guideline. Of course, there's a quite a bit of overlap as you transition from one level to the next:

1. Last major race of 2007
2. Rest and recovery
3. Fun exercise, cross-training, off-season

sports

4. Planned, sequential aerobic exercise as the new season approaches
5. Specific anaerobic efforts mixed in with longer and harder aerobic sessions.
6. First race of 2008

Aerobic or anaerobic exercise during the off-season?

In order to perform your best during your racing season, you need a generous amount of anaerobic exercise on top of your aerobic base. Just what is the difference between the two, and how does each contribute to our fitness? These are important questions for every endurance athlete. For the answers, read on!

Aerobic exercise refers to cardiovascular work by the body in which oxygen is readily available. At low intensities (less than 70% max heart rate), you can maintain aerobic exercise almost indefinitely, as long as working muscles receive fuel and oxygen. Large volumes of aerobic exercise have been shown to help uphold muscle memory in addition to conditioning your cardiovascular system. Aerobic exercise will not only improve your endurance and stamina, but will also help prevent burnout before those early season races.

Another benefit of aerobic exercise is that it teaches the body to use oxygen more efficiently. Regular long, slow aerobic exercise sessions will improve cardiac strength and output, thus improving oxygen delivery to working muscles. The moderate rise in heart rate will help train the body to efficiently use fatty acids and stored carbohydrates (glycogen) for fuel.

If you are looking to shed several

unwanted pounds, I recommend that you train aerobically during the off-season while paying attention to what you eat. Through low intensity endurance exercise and a calorie-controlled diet, you will encourage the oxidation of fat for fuel, thus burning many calories from fat. However, with fat as the major energy source during aerobic exercise, the process of burning calories is slow, and exercise must be maintained for long periods. Anaerobic exercise expends more calories per unit time and also boosts metabolism, resulting in increased caloric expenditure post-workout. However, it is harder to maintain an anaerobic pace for very long.

Anaerobic Exercise refers to activities that put you in oxygen debt. A good rule of thumb is that if you can't talk, you're anaerobic. More specifically, it refers to that zone of intensity when you're at about 85% of maximum heart rate. This is also known as the lactate threshold, when your muscles begin to accumulate lactic acid. Anaerobic training increases this threshold and builds short-burst energy for power and sprinting. Incorporate anaerobic training into your aerobic training plan in order to encourage physiological adaptations such as speed, power, and stamina.

Burgomaster et al.² studied the effects of six sessions of sprint interval training on citrate synthase maximal activity and aerobic exercise capacity in eight active subjects (age 22 +/- 1 yr). Results showed that sprint interval training (15 minutes over two weeks) during intense aerobic cycling increases muscle oxidative capacity while doubling endurance capacity. You do not need to have long intervals or maximum effort, but you do need to get your heart rate up to at least 80% of maximum to generate anaerobic benefits.

Recently, Esteve-Lanao, et al.³ compared the effects of training below and within the lactate threshold in 12 sub-elite runners. Subjects trained over a five-month period and were designated to train at a low-intensity heart rate (subthreshold) or at a moderately high-intensity heart rate (between ventilatory and respiratory threshold). In summary, athletes in the subthreshold group spent 80% of the five-month study training at a subthreshold heart rate and significantly improved their 10K time after the

study (compared to before the study). Although athletes in the moderately intense group only spent 66% of their training time above threshold, results demonstrate that athletes may improve performance when the majority of training is performed at low-intensities (subthreshold).

In addition to anaerobic exercise, it is wise to incorporate resistance training, plyometrics, and explosive training into your off-season routine. Paton and Hopkins studied the gains of 4-5 weeks of explosive training and high-intensity interval training in 18 road cyclists during the noncompetitive part of the season.⁴ The experimental group replaced their usual off-season training with twelve 30-minute sessions consisting of single leg jumps alternating with high-resistance cycling sprints. Relative to the control group, the experimental group showed major gains in sprint and endurance performance through an improvement in 1-km of power, 4-km of power, peak power, oxygen cost, and lactate power. In addition to the exercise you do outside of the gym, include high-intensity resistance training and explosive training in order to improve your exercise efficiency and anaerobic threshold.

Enjoy your off-season!

Physical activity helps rebuild and relax your repeatedly stressed muscles, ligaments, and joints. Without adequate rest and recovery after your all-out performance at your last race, the chance of injury, illness, and fatigue is at its highest, especially during the first week following a major competition (2-3 weeks following an Ironman). Although your body may feel recovered, give yourself at least a week before resuming regular exercise.

By incorporating several speed sessions into your weekly aerobic workouts, you will continue to stimulate the anaerobic system without working hard all the time. The best workout for the off season is any type of physical activity that is cardiovascular effective. Raising the heart rate to 65%-75% is considered adequate for burning fat. Any additional rise in heart rate will require the anaerobic system to use stored carbohydrates. Seeing that the

body only holds around 2,000 calories of carbohydrates (compared to over 100,000 calories of stored fat), be sure to properly fuel before anaerobic and aerobic workouts (check Hammer Nutrition guidelines for pre, during, and post training nutrition). Always make sure that your choice of activity is fun and exciting. Focus on your weaknesses within your sport of choice (stride, cadence, power, stroke work) and add several intervals of sub-maximal, maximal, or explosive efforts to your training routine. The more variety you have during the off-season, the better the psychological and physiological benefits. Not only will exercise keep you looking good during the off-season, but you will feel healthy, happy and fit during your time away from competition.

References:

1. MyPyramid.Gov. United States Department of Agriculture. 05 Dec. 2007 <http://www.mypyramid.gov>.
2. Burgomaster, K.A., Hughes, S.C., Heigenhauser, G.J., Bradwell, S.N. and Gibala, M.J., 2005. Six sessions of sprint interval training increases muscle oxidative potential and cycle endurance capacity in humans. *J. Appl. Physiol.* 99(6), 2473-4.
3. Esteve-Lanao, J., Foster, C., Seiler, S. and Lucia, A., 2007. Impact of training intensity distribution on performance in endurance athletes. *J. Strength Cond Res.* 21(3), 943-9.
4. Paton, C.D. and Hopkins, W.G., 2005. Combining explosive and high-resistance training improves performance in competitive cyclists. *J. Strength Cond Res.* 19(4), 826-30.

Marni holds a Master of Science degree in exercise physiology and is a Certified Sports Nutritionist. A Level-1 Coach and a Hammer and Zoot sponsored athlete, Marni enjoys writing and public speaking. She recently completed the Ford Ironman World Championships in Kona, Hawaii on October 13, 2007 and also qualified for the 2007 Ford Ironman 70.3 World Championships. Questions? Email Marni at mrakes1@hotmail.com or visit www.trimarni.com



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Join the e-Stim revolution

Was Compex - now it's Globus

Brian Frank



Over the past 4 years we've had some difficulties in our relationship with Compex from a corporate management stand point, which were not remedied and have forced us to seek alliance with another company. Before explaining further or giving details on the new brand, I want to reassure all of you who currently own a Compex e-stim device, also called EMS (Electrical Muscle Stimulator), that you have a great product and we will continue to support you with replacement pads, accessories, and warranty repairs as if nothing had changed. We will also continue to provide post sale usage guidance through our discussion forum and directly with our EMS trained staff. If you have a unit and are not using it daily, contact us so we can help you get better acquainted with it and design a usage plan that will enhance and propel your traditional training program.

I thank you for trusting me enough to buy this product sight unseen. If you are using the unit with any regularity, you likely are very satisfied with your purchase. You should feel good about this purchase and the knowledge that you were the first to benefit from square wave, bi-phasic EMS technology. This technology is here to stay and will only increase in popularity in the future.

The move away from Compex in no way diminishes the value of the technology of the unit you own. It's a reality that with a revolutionary technology like this, additional brands will be introduced and all brands will undergo updates and enhancements in successive generations just like computers. This is what is going on now.

As I said earlier, the Compex EMS was and still is a great product. However, the company has been sold three times

in the past 4 years and we got lost in the shuffle. Also, while their European units received updates, the US product remained unchanged. The final straw was their inability to supply product for almost all of 2007.

After single handedly marketing and promoting the Compex brand for the past two years, I've made the difficult decision to switch to their primary competitor in the European markets, Globus. Globus is a comparatively small, privately owned company still in the hands of its founder (just like my company). I have already met with the owner and the US agent and we have formed an alliance to properly market and promote this technology and their brand in the US.

Keep in mind that in 2004 when we first began promoting EMS, Compex was the only brand with FDA clearance that could legally be sold in the US. As of July/August of 2007, that was no longer the case with the emergence of a second brand. This gave me the opportunity to choose the brand which I felt would be the best partner and provide the best products and support going forward.

Please do not misunderstand, I am more firm and believe more than ever that square wave e-stim is amazing technology that produces benefits that I would pay several times the going rate to enjoy. I use it everyday and think that you should too. In fact, I believe so strongly in this technology that Dr. Bill, Steve and I will be in Italy as you read this for intensive training with the foremost expert in the field of EMS. We'll keep you posted on the results of our training in future issues of Endurance News and on our web site.

Globus produces hand held EMS or e-Stim devices that are "just like" the

Compex units, only different. While the Globus units employ the same square wave technology, they also offer a very large array of features and programs that are not offered on the US Compex models, or even the European ones as far as I know.

Globus offers a "fitness" unit with limited programs and a "sport" unit with a larger array of programs. You can read more about these products on page 18 & 19 of this issue of Endurance News and you'll find comprehensive details, including a detailed comparison chart, on our website.

We have both the Fitness and the Sport units in stock and ready to ship and are offering the same pricing on the Sport units, the same 30 day in-home trial, and convenient payment plans as we did previously. If you have been intrigued by this technology, now is the time to get one and give it a good in-home trial. You'll be surprised and impressed.

If you have any questions, please do not hesitate to contact us. We have several staff members who are familiar with the Globus products specifically, as well as EMS, and will be happy to help you out.

HOT TIPS

Limit Your Nighttime Food Intake

Metabolism is most active up until dinnertime, so the majority of your food intake should occur before that magic hour of somewhere between 5 and 7 p.m. High calorie evening and late night meals jeopardize normal sleep patterns and thus severely limit human growth hormone (hGH) release, which is absolutely KEY for you to improve, grow stronger, and stay healthy.

Read what athletes just like you are saying about their e-stim devices.

"For the first 50,000 miles of my running career, I was able to run through every single cramp. So when my calves felt tight while jogging before a spring, 2004 speed session, I stretched well and as always started the workout. During the first stride the left calf, then the right, seized in excruciating pain and it was all I could do to walk the mile home. Racing took a back seat to this "injury" and the rest of that year and well into the next, despite all the therapy, was largely a washout as the flare-ups became routine. Finally, I skeptically bought an E-Stim machine figuring what do I have to lose? As it turned out, only the golf-ball sized knots in my calves. Within 3 treatments, they were down to grape-sized, and within a month were virtually gone, and with regular e-stim sessions, they've never returned. If you are suffering from a similarly pesky condition, especially in the calves where reduced circulation is a reality for many aging athletes, I strongly urge you to give the E-Stim a try. The Active Recovery program alone is worth the price."

Tony Schiller
9 time Age Group National Champion
5 time Age Group World Champion

"Thank you for introducing me to the e-stim device. I had been using it to get ready for the California International Marathon. It was the best marathon I have run, thanks to my unit (and of course my Hammer Nutrition products!!). I have run much faster marathons going back 32 years, but technically this was the best ever: I kept my HR pegged at 85%, my pre-race goal, and I kept good form the entire race. My legs never felt so good. Today I can hardly feel the effects of the race; I even rode my bike to work! And I qualified for Boston again!"

Fred Goss

"I employed EMS while training for the New York City marathon and loved the device so much, I ended up buying it. It's done EVERYTHING that Hammer has said it would do. Every single marathon training cycle that I had gone through before I was plagued with injury at some point - not this time while using e-stim."

Dustin Holmes

"I bought my EMS unit from Hammer Nutrition about two years ago based solely on their recommendation and have been a very consistent, satisfied user ever since. Recently, I wasn't able to do my normal e-stim strength and recovery sessions for several weeks.

Interestingly, NOT having access to my regular e-stim sessions allowed me to fully appreciate all of its benefits. Typically, I use Active Recovery daily and after just a few days of not being able to do it, my legs started feeling stale and heavy. I went and got a couple of massages and realized just how much money I've saved on massages alone. Over the last 2 years I would have spent over \$2,000 on massages, so the Active Recovery program alone saved me \$1,350 or more!

Since I couldn't e-stim, I decided to start going to the gym for lower body strength training. In addition to the extra time going back and forth and the expense, I started to notice joint pain. I realize now that when using e-stim, I get much stronger muscular contractions, yet don't expose my joints to injury. Again, amazing.

These past couple of months have proven the huge impact this product has had on getting me closer to my goals and feeling more recovered on a daily basis. In combination with intelligent sport specific training, good diet and nutritional supplementation, I think EMS is essential equipment."

Steve Kaplan

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Building your base

Raise your ultimate speed potential with this new approach

Al Lyman, CSCS

As most endurance athletes know, you need to build a deep level of aerobic fitness if you are going to reach your potential in your most important events. For most of us, this time of year, traditionally known as the “base” period, is when we are focused on starting to build that aerobic fitness that is so important for success.

Traditional thinking states building a “base” is accomplished by gradually increasing mileage while maintaining a relatively low intensity. At first glance, this thinking makes sense, because after all, you have to put up the foundation before you can build the house, right? Proponents of this conventional approach believe that this modest buildup (based largely upon heart rate) is the best way to prepare for more challenging training to come, and that fast training is too anaerobic to develop aerobic capacity or expand endurance and puts too much strain on tendons and ligaments. As you enter 2008 and begin to plan so that you show up at your most important events ready to reach your goals, are you confident that accumulating easy miles in lieu of other types of training is the optimal way to train during the base period? Is there another, better, way?

For pure novice athletes who are at the very early stages of learning to train as endurance athletes, this approach might work well. But for the great majority who have some experience and want to improve, it is time to come out of the dark ages! Covering gradually longer distances at a relatively slow pace early in the training season is not the optimal way to prepare yourself for more challenging training to come. If that’s all you do, you will surely leave this base period with a smaller VO₂max, fewer capillaries, lower overall strength, and a

smaller lactate threshold.

What I am talking about as a new and different approach isn’t really new at all. Well-known South African researcher Tim Noakes may have started this “new” way of thinking way back in 1988 with a landmark investigation.¹ The bottom line: it isn’t enough to cover more miles and to worry ONLY about your aerobic development during base training. To train smarter and better during this off season and during your base training, you need to do a certain amount of training designed to help you develop and improve your coordination and neuromuscular/functional strength and proprioceptive abilities, also sometimes thought of in a negative context as being “anaerobic.” Training this way will have you mixing in short periodic bouts of very fast movement speeds, proprioceptive and functional strength work, and approach it all with a renewed focus on skill and technique improvement that is based more upon neuromuscular rather than aerobic characteristics.

Before some of you jump up and start screaming about Lydiard or about training too hard, too soon, my point isn’t to downplay the importance of aerobic fitness or to have you training “hard” or excessively all year long. “Fast, quick, and well-coordinated” are words many of us wrongly associate with hard. In my experience, many of our traditional ways of thinking about how to efficiently and effectively achieve more endurance, stamina, and speed, are based upon myths, and as we all know, myths die hard. For example:

MYTH: Carrying out lots of training makes us more economical because the body adapts to this larger volume, making us more efficient.

FACT: A major study found that running volume isn’t connected with economy at all. It is negatively correlated with age: the longer an athlete has run, the less economical he or she becomes.²

MYTH: Higher mileage and volume is the best way to boost your VO₂max, fat burning ability, and lactate threshold.

FACT: The latest research indicates that higher intensity efforts work better at improving all three of these components of endurance fitness. In fact, one of the greatest improvements in VO₂max in a scientific study actually links increase in VO₂max with a decrease in mileage.³

MYTH: Lactic acid is a waste product that produces muscle soreness.

FACT: It’s a key muscle fuel that is not responsible for the soreness you feel after hard efforts (that soreness is likely due to microscopic cell damage).

MYTH: Strength training is anaerobic; it will make us big and slow us down.

FACT: The right kinds of strength training produce major upswings in aerobic capacity and will improve coordination and enhance economy, helping to improve our performance and making us more resilient and fatigue resistant.

MYTH: Training volume is the most accurate predictor of performance for endurance athletes.

FACT: Economy (defined as the oxygen cost of moving along at a specific speed) and lactate threshold are much better predictors of potential performance.

MYTH: If you train fast, you are working the fast twitch fibers, which are good for sprinting, and if you train slowly, you are working the slow twitch

see AL on page 21

AL from page 20

fibers, which are good for endurance.

FACT: Sprint training can elevate V02max and many other oxidative characteristics in a more time efficient and effective manner. Even if all of your muscles are slow-twitch, you can still train very fast.⁴

I think we would all agree that developing your aerobic endurance is absolutely essential for success, and in fact, improving your aerobic endurance and stamina is a primary goal for every endurance athlete's training, not only during the off-season, but throughout the entire training year. The point is that while a certain percentage of your training should be easy-to-moderate in intensity, perhaps "long and slow" isn't ALL you should be doing during your base to prepare yourself for faster and more challenging training to come.

A different approach

This different approach to base training of shifting away from only building mileage at a moderate intensity is focused around two principles:

1. The ability to go faster, longer, is partly a function of neuromuscular attributes. In other words, the ability to run, swim, and cycle better is largely about functional strength and the ability of the athlete's nervous system to coordinate that strength and apply it with as much quickness as possible.
2. It is outmoded thinking to look at the paradigm for endurance sports as aerobic OR anaerobic, or to look at pure cardiovascular conditioning as THE most important element for success. Power, speed, and resistance to fatigue don't fall upon endurance athletes like magic pixie dust after prolonged periods of longer slower training. They are best developed by carrying out the right kind of training sessions that maximally enhance neuromuscular coordination and build functional strength.

Now that I've got you thinking outside of the box a little, you are probably asking, "What are some of the practical ways that I can apply this approach in my own base training?"

SWIMMING: If you are a triathlete, you swim in the open water. To be effective and efficient in the open water

requires, among other things, that you are able to put pressure on the water repeatedly without fatiguing. Rather than look at total swimming yardage at a moderate intensity as a way to be able to accomplish this, shift away from a mindset of accumulating yardage to one of swimming quality yardage. It is true that skill will always set the upper limit to how far your fitness will take you, and skill is about training and re-training your nervous system! For many, the last piece of the puzzle may ultimately be training to hold

a higher stroke rate for your goal race distance as well. Note that this and the recommendations below are largely about skill, coordination, and muscle contractility (the quickness and forcefulness of a muscle contraction), NOT about heart rate or pure training volume.

What you can do now:

1. Start incorporating a variety of dryland tools such as the Vasa Ergometer and Vasa-Trainer and stretch cords to effectively build the functional strength you need to apply correct technique (particularly an "early vertical forearm") in the water.
2. Commit to improving your upper body flexibility, so that the coordination of the "correct" swimming movement patterns becomes easier and more relaxed.
3. While you need to swim with correct form, you also need to occasionally get out of your comfort zone and train your nervous system to turn your arms over more quickly and stroke faster. A slow front quadrant stroke isn't always the most effective for open water.
4. Incorporate sets of "swimming golf"

to determine whether you should be increasing or decreasing your stroke length or rate for optimal speed. Email me directly for more information on Swim Golf.

5. At the USA Triathlon Coaching Conference in March of 2006, noted swim coach and author Ernest Maglischo

made a startling presentation about triathlon swim training, particularly as it relates to stroke rate and front quadrant as I alluded to in #4, as well as the early vertical forearm, which are all largely neuromuscular in nature. To read my notes from his presentation, go here: <http://www.pursuit-fitness.com/phpBB2/viewtopic.php?t=31>



Paul Moir stays focused.
Photo - courtesy of Paul Moir

CYCLING:

On the heels of Lance's seven victories at the Tour De France, much has been written about the merits of high cadence spinning as well as the merits of various modes of strength training for cyclists. In my experience, these issues are all about coordination, and more specifically about velocity or speed, because gains in strength and coordination are speed specific. The key question every cyclist has about this topic is, "If I replace some of my riding time with strength training, will I lose my aerobic fitness and see my performance on the bike worsen?"

In my experience, the right kind of strength training is not only essential for performance, it is important for your health and longevity as a cyclist, and it is true for runners, too.⁵ One scientific study showed overwhelming performance gains for a group of cyclists who reduced their riding miles dramatically while employing high intensity "explosive" strength training compared to a control group who did more mileage but no strength work. The cyclists who rode less but trained to improve their

see AL on page 22

AL from page 21

neuromuscular coordination, functional strength, and quickness saw major gains in efficiency, V02max, endurance, threshold, and power.⁶

The same thing applies when discussing high-cadence spinning and other skill drills designed to improve neural pathways and coordination. Incorporating skill drills and high cadence work isn't just for winter or base training; there is benefit to performing these drills throughout the entire training year. If you can practice pedaling faster and smoother

at all intensities, you will improve your ability to feel and reference all aspects of the pedal stroke (to more effectively vary muscle recruitment and spread the workload out), and sustain a higher overall cadence during rides at your goal race speed/pace. That in turn transfers more of the stress of pedaling from your muscles to your cardiovascular system, which leaves triathletes with fresher legs for the run.

What you can do now:

1. Devote one ride each week during this base phase to developing your ability to sustain a higher overall cadence. Incorporate specific skill drills such as one leg pedaling, various float drills, and super-spins, to improve your nervous system's ability to more quickly coordinate the appropriate muscle firing action. During most of these skill drills, resistance should be very light, so use an easy gearing. Focus on quickness and smoothness, not on building strength by pushing against greater resistance.
2. On and off the bike, circuit training is a time effective way to combine strength training with on-the-bike pedaling skills, which are sure to boost your efficiency,

coordination, and functional strength. I've used these sessions for years with clients, who all say that they are fun, too. The idea is to structure a series of on-the-bike intervals with off-the-bike functional strength exercises. The exercises should challenge your balance

and coordination and be closely related to the movements of cycling. If you would like an example of a typical circuit session for cycling, email me directly at coachal@pursuit-fitness.com, and I will be happy to reply with a session for you to try.

RUNNING: No other sport is as positively affected by modest amounts of mileage combined

with functional strength work and speed training as is running. There's an overwhelming body of scientific evidence that shows that running well is as much or more about your neuromuscular coordination and functional strength than it is about your cardiovascular conditioning. With running, the nervous system plays a critical role in enhancing economy (so you can run faster using less energy) developing running-specific strength (so you can cover more ground with every stride), and even preventing injury (so you can avoid frustrating breaks in your training). According to running expert and noted physiologist Owen Anderson, Ph.D., carrying out the right kind of neural-based training can help your nervous system "learn to activate motor units in a way which will produce not only the desired level of strength and power, but also the most energy-efficient production of strength and power."⁷ The bottom line: Don't exclusively run easily while gradually building mileage. If you do, you'll finish your base period with a smaller V02max, few capillaries, lower overall strength, lesser lactate threshold, and not nearly as much speed as athletes who systematically incorporate whole-body functional strength and high-quality

running into their base work.

What you can do now:

1. Start incorporating running-specific core and functional strength exercises into your program as soon as possible to develop a foundation of strength that is an ideal platform for technique improvement and injury resistance. Examples include one leg squats, step-ups, paw-back leg swings, and various hip extension exercises using a Swiss ball to strengthen the hamstrings and glutes together in a running-specific way.
2. Start incorporating strides or pick-ups into nearly all of your runs. I call these strides "form accelerations." They are very short bouts of 20 to 30 seconds of fast running where your focus is on maintaining good running form and getting your feet UP off of the ground quickly. Strides get you out of the rut of always running slowly (plodding), without adding undue biomechanical stress or inducing too much fatigue. Yes, it's true: very often when you pick up the pace for short segments, you awaken your nervous system, get the blood flowing, and you feel better and more lively afterward than before. When it's time to transition to faster, more intense in-season training, that transition is very easy to make. You will be ready!
3. Gradually begin to incorporate hopping, skipping, and bounding drills into your run training as part of a progressive warm-up routine, all of which help improve your form, and enhance strength, dynamic flexibility, and the resiliency of your feet and legs, preparing your body for the quality running that may follow.
4. Like cycling, circuit training is an excellent way to strengthen your whole body and improve your coordination in a time-efficient manner. The exercises you use in the circuits should force your whole body to work together efficiently as it must do when you run. The rationale for these circuits and this kind of training is that it makes your whole body more fatigue resistant, and the strength and coordination you gain improves your running economy, so that your aerobic run pace in general, and high-quality running speeds in particular, feel easier to you. For a sample circuit training session for running, please email me directly at coachal@pursuit-fitness.com, and I'll happily reply with a session for you to try.



Kay Uibel powers up Hudson Divide.
Photo- Matt Wingate

Remember, employing neuro-muscular focused drills into your running sessions can be tiring. It is very important to start conservatively and differentiate pace and intensity in all sessions. For instance, when doing strides, or any hopping or skipping drills, make sure you warm up well before doing them. After you've completed a certain number of reps and you're feeling tired, return to your easy or aerobic pace to complete your run session.

Nothing that I have conveyed in this article means that your overall training pace or intensity should rise. Always train smart, differentiate pace, be purposeful, and keep the majority of your training aerobic so that you recover well and do not fall into a "gray zone" mentality where you are training "sort-of-hard" all of the time.

YES, YOU CAN CHANGE! It is true that for some of you reading this, what I've discussed in this article involves some kind of **CHANGE** for you, compared to the way you have done things in the past. Yes, believe it or not, **YOU CAN CHANGE!**

You **MUST** believe that you have a powerful ability that can be extremely useful in just about any situation. You have the ability to change. It's something you do regularly, and you probably just take it for granted. Observe, learn, experiment, get out of your comfort zone, make some smart decisions, and be willing to change! That doesn't give you an excuse to abandon your self-discipline and commitments. Though you may feel stuck in one place, that is certainly not the case. With your time, your effort, and your commitment, countless positive possibilities are open to you. You can improve your skills, strength, coordination, and flexibility. You can become a better, stronger, and faster endurance athlete. You can bring these possibilities into reality. Best of luck!

Reference available upon request

Coach Al Lyman, CSCS, is the owner of www.Pursuit-Fitness.com, a coaching company for endurance athletes. Besides being an Ultrafit Associate and certified with USA Triathlon, USA Cycling, and the NSCA, he is the creator of Runner-CORE, a NEW fast, effective, time-saving program for triathletes and runners of all levels. For more information and tips: go to: www.Runner-CORE.com. Email: coachal@pursuit-fitness.com

Sponsored Events

Our best year ever!

Brian and Steve stand guard at the booth

Steve Born

With a total of 1857, it's an obvious understatement to say that in 2007 we sponsored a lot of events! It's the highest number of domestic events we've sponsored in the 20+ year history of Hammer Nutrition, breaking last year's mark of 1820. Add in our Canadian sponsored events and the other race bag program organizations we provide samples for, and we topped out at over 2000. Now that's a lot of events!

This year also set a record for the amount of supplies we provided for the races. In 2006 we breached the half million mark for the first time and 2007 saw us eclipse that standard by a substantial margin... we supplied a staggering total of nearly 615,000 race bags! The amount of product samples & brochures we provided is even higher than that, as some of the races we sponsor use their own goody bags. Needless to say, a lot of Hammer Gel pouches, or sample packets of HEED, or Endurolytes sample packets found their way into the hands of lots of athletes!

In 2007, a tremendous number of races switched over to using HEED as their on-course drink mix. And while I don't have a figure for how many thousands upon thousands of gallons of HEED were consumed at all these races, I do have a figure for how many HEED cups we provided... are you ready? In 2007, for the races that needed cups at their aid stations, we supplied over 1.5 million. That's correct-1.5 million HEED cups!

Some other interesting stats:

* Hammer Nutrition sponsored events in all 50 states for the second time in history (2006 was the first time this occurred). California led the way with 147 sponsored events, followed by Michigan (111),

Florida (105), Texas (94), North Carolina (83), a tie between Colorado and Virginia (both with 76), a tie between New York and Washington (both with 63), a tie between Montana and Pennsylvania (both with 57), Illinois (56), Wisconsin (54) Arizona (51), and Georgia (50). Several other states hovered around the 50-sponsored-events mark.

* If it's "endurance" chances are Hammer Nutrition sponsors it! In 2007 duathlons/triathlons were once again "king of the hill" with 630 sponsored races. Next was mountain biking with 339 sponsored events, closely followed by running events (primarily marathons to ultra distance events) with a total of 321. After that came adventure racing (202), road cycling (183), and various camps & clinics (151).

* Not surprisingly, we sponsored events during every weekend in 2007. June was our top month with 277 sponsored events! June had five weekends so that's an average of a hair over 55 events per weekend. September, which also had five weekends, had 273 events, an average of just under 55 per weekend. August was third with 234 events, but since it had four weekends it had a higher average on a per-weekend basis-58.5 events per weekend. Our other top months were August (234), July (222), and May (204).

Needless to say, we're very excited about achieving this new standard in event support and we look forward to even higher sponsorship numbers in 2008. As I'm fond of saying, "If you're going to an endurance race, chances are you'll see Hammer Nutrition there!"

Hammer Camp *A Skeptical Cyclist in Tucson*

Chris Kostman

Hammer Campers
Photo - Owen Gue

Having been a member of the Skeptics Society since it was founded in 1992, my skeptical nature is well known. Not only that, but I bagged out of the last two week-long cycling camps I attended because they were so poorly organized and populated with people who had zilch to talk about besides, well, cycling. In one case I left after less than 24 hours and in the other I survived 48 hours before I escaped to another hotel and my own itinerary.

So what the heck was I doing on my way to Tucson, en route to the December cycling camp hosted by the cycling food gurus at Hammer Nutrition and based at "The Cycling House?" I guess I was wishing for "third time's a charm" and not "three strikes, you're out." (Not to mention a leg up on the impending holiday food fests.)

Fingers crossed, I exited I-10 in Tucson after a 400-mile cruise from my base camp.

Tucson is a city in the middle of the desert that sprawls a million miles in every direction. The last time I rode there, at the famous century ride, I was incredibly nonplussed by the landscape and urban sprawl. Although it was well organized, I was bewildered as to the ride's popularity.

It was literally 15 miles from the freeway exit to the driveway of The Cycling House, a 6,000 square foot, two-story mini-mansion located in the Sabino Canyon area of northern Tucson. This location put us well away from urban sprawl and afforded truly spectacular views from the house of the Coronado National Forest, the Santa Catalina

Mountains, and innumerable saguaro cacti, those huge, ubiquitous hand-like cacti with "fingers" as big as telephone poles which reach towards the sky in this part of the country.

OK, a great setting, but what about my fellow housemates? Let's put it simply: I never once heard, or was asked, "So, what do you do for a living?" I also never heard a single comparison of century times or Ironman PRs or the like. There were fourteen of us (13 men and one woman) and we were all there for the same reason: to truly get away from the day-to-day accoutrements and business of life and work; to cycle daily in relative good weather (for December); to learn; and to enjoy the entire experience. The atmosphere was non-competitive, welcoming, inclusive, and just plain relaxing and pleasurable. We had cold weather escapees from North Carolina, Boston, Texas, Manhattan, Long Island, plus one Arizonan and myself from California. There were cyclists, triathletes, and an adventure racer. There wasn't a "dud" in the group, I'm happy to report.

Running the camp was Brian Frank, the president and founder of 20-year-old Hammer Nutrition, a man whose company and products are incredibly well known in the cycling and endurance sports worlds, but who has employees more "famous" and commonly seen than he is. As a company, Hammer is built upon quality of products and service, rather than hero-worshipping its founder, as many companies in the cycling industry seem to do. Co-hosting the five-day camp with Brian was Jim Bruskewitz, a cycling and triathlon coach from Madison, WI. Both men were

extremely affable and approachable, while also being rock-solid encyclopedias of information and wisdom as well as sneakily impressive athletes.

Running The Cycling House as well as driving the sag van on each day's ride was Owen Gue, a semi-retired professional cyclist in his early 20s who is also the co-founder of 53x11 Coffee. He was assisted by Andy Schultz, a 24-year-old professional mountain bike racer who is the reigning Under-23 National mountain bike champion. Both from Montana, like Hammer, they are friendly, accommodating, helpful hosts. They're also supremely fit and the kind of well-mannered boy-next-door type that most mothers probably hope their daughters will marry. Andy was the on-bike ride leader and was joined each day by one or two locally based (at least in the Winter) pro cyclists such as David Glick and Brendan Halpin who rode sweep. I'd never head of any of these guys, but they rode like stars while being friendly and helpful; they all oozed that kind of skinny confidence and charisma that people like George Hincapie exude. I think they'll all be famous some day.

OK, so great house, great participants, great hosts, great cyclists, but what about the riding?

In a word: superb! Each day's ride was progressively longer, from a 20-mile stretch-your-legs cruise on the afternoon we arrived through 40, 50, and 60 miles in length as the days progressed. The routes were each a bit different and involved rolling terrain, almost always quiet roads, and explorations of the

see *TUCSON* on page 27



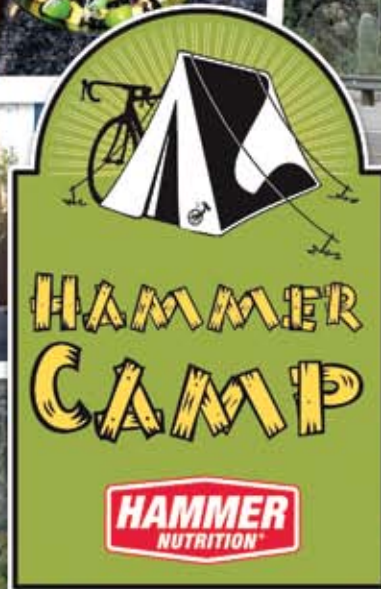
Good fun...



Great food...



Awesome rides!



Glycogen Synthesis/ Carbo Loading

Bill Misner, Ph.D.

Nick Erhardt does a bit of climbing in Yosemite National Park. Photo - Scott Woods

It takes about 75-90 minutes of sustained exercise to deplete enough muscle glycogen to stimulate the glycogen replacement process. The key enzyme for converting ingested carbohydrates to glycogen is glycogen synthase. This enzyme is paramount for driving carbohydrates back into the muscle glycogen storehouse instead of becoming fat deposits. Glycogen synthase is plentiful and active for up to two hours post-exercise, defining the replacement window for optimal post-exercise carbohydrate replacement and glycogen replenishment. The harder you exercise during the first hour, the sooner elevated levels of glycogen synthase will peak.

In addition to our muscle glycogen, endurance athletes also make good use of body fat stores for energy. Most endurance athletes are enzymatically well trained to draft fuels from body fat stores, having repeatedly exposed themselves to duration-dependent fat metabolism. Fat metabolism occurs mostly after the first 75-90 minutes of exercise.

Glycogen remains the prime fuel, and proper carbohydrate consumption post-exercise will ensure maximum carb-to-glycogen conversion and storage. Research suggests that daily consumption of 60%+ of your calorie needs from carbohydrates will serve to top off the glycogen stores, especially if a 200-250 gram bolus is consumed immediately following a depletion workout.

How much total carbohydrates should be consumed for loading an athlete's glycogen? See Table 1.

Ivy (1988 J APPL PHYSIOL) also demonstrated that the maximum rate of carbohydrate synthesis occurs after ingesting 225 grams of glucose polymers [maltodextrins] within a 4-hour window post exercise. The dose is stored best during the first 30 minutes after your

Table 1

Daily CHO intake	Exercise duration
5-7 g/kg/day	2 hours or less exercise/event
7-10 g/kg/day	3-4 hours exercise/event
10-12 g/kg/day	5-6 hours exercise/event

Reference: Hawley, J.A., Burke, L.M., Peak performance training and nutritional strategies for sport, Allen and Irwin, Sidney, 1998

workout is finished. Except for larger athletes, excess carb intake over 225 grams might end up as stored fat, not glycogen. As a good guide, I recommend a daily carbohydrate consumption in the range of 600-900 grams, or roughly 2-3 g /2 hrs workout/pound body weight. Reminder, to avoid fat deposition, the body likes small meals of 200-250 grams each, at least 60-90 minutes apart. The following table gives more detail. The figures are for daily totals, including pre, during, and post exercise intake and all meals.

Total Recommended Daily Carbohydrate Intake

Table 2

Weight	Training - hrs/day		
	2	4	6
110 lbs	300	500	700
132	400	600	800
154	500	700	900
176	600	800	1000
198	700	900	1100

Carbo Loading

In my own personal experience, carbohydrate depletion/loading has had mixed results. A typical 3-day carbo-depletion phase followed by a 3-day carbo-loading phase has worked well only once in the numerous times I tried it. One time it backfired, causing weight gain, either because I overate or because of the carbohydrate-induced excess water retention. Then on top of that, I had stomach problems during the event. If

you want to try carbo depletion/loading, I recommend 60-70% of total caloric consumption from carbohydrates, but no more than 200-250 grams in one hour immediately following a single 60-90 minute depletion workout, performed at an easy 60-75% maximum heart rate.

An interesting study reports which kind of carbohydrate drink enhances muscle glycogen stores best:

Effect of different carbohydrate drinks on whole body carbohydrate storage after exhaustive exercise

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 subjects first completed an exercise protocol to deplete muscle glycogen, then they consumed 330 ml of one of three carbohydrate drinks: (a) 18.5% glucose polymer, (b) 18.5% sucrose, and (c) 12%

see CARBO LOAD on page 33

TUCSON from page 24

perimeter of the greater Tucson area and beyond. We rode a loop through the Saguaro National Park and we climbed all the local epic climbs like Gates Pass and others whose names I've forgotten. We rode in pacelines, in small groups, and occasionally alone, but there were numerous regroupings on each ride and nobody ever went missing or felt "all alone out there." As each day started off cool, we could peel clothes and dump them in the sag van as needed, as well as refill water bottles and partake in the endless supply of the entire Hammer product line.

The highlight ride of the camp was the ride up Mt. Lemmon, a 20-mile and 6000 foot ascent through multiple microclimates and bio-zones. Like all mountain climbs, it got cooler as we climbed higher; ultimately we rode up into a damp, chilly fogbank in the 7000-8000' elevation range which was literally 30 degrees cooler than at the foot of the mountain. It was a relentless, but not impossible, climb and the weather change made the experience all the more epic and memorable. With a quick change into warmer clothes, we enjoyed a downhill, which seemed to go on forever and afforded expansive views in nearly every direction. It was a truly awesome ride and worth the trip to Tucson just for that!

But life in The Cycling House at Hammer Camp is not just pedaling. To ensure we would be strong and ready to ride each day, we drank Recoverite immediately after each ride, then we could get optional massages each afternoon and/or hook up to Globus e-stim units to help our muscles recover with an electrical current. I particularly liked the Globus unit and definitely seemed to benefit from the "active recovery" it provided. I "should have" had tired quads by day three or four, but I never did and a chunk of the credit goes to the Globus unit.

We also enjoyed very tasty, wholesome meals, which were brought in by a healthy food caterer each afternoon and evening. (Breakfast was oatmeal with nuts and raisins or pancakes pumped up with Hammer protein powder.)

As a vegetarian for 17 years, (and, to my surprise, the only one attending the camp), I was provided quality alternatives to the meat entrée which the others ate. The menu was crafted to not only taste really good (usually featuring a Southwest theme) but also to refuel us well in order to enhance recovery and overall health. We all learned some new cooking and shopping tricks, for sure. The only snack food in the house was fruit and trail mix, but that was fine and I didn't feel the need to graze between meals.

We also had the option each afternoon of going to the pool for swim coaching by Jim. I wish I'd brought my goggles and swimsuit so that I could have done that. Some people also went for a run each day, while a few of us also made a coffee and chai run (by car) a few of the afternoons. Some even took naps!

After dinner each evening we had a group chat in the living room. People asked questions about Hammer products, training, or anything they were curious about. Brian and Jim-and sometimes the rest of us-gave thoughtful answers. People were really forthcoming about their goals ("I want to be able to finish an Olympic distance triathlon comfortable" or "I want to figure out how to fuel properly because I'm sick of getting sick when I race" and such.) We all learned a lot and the conversation would often go on for an hour or more. The camaraderie and lack of judgment was refreshing.

We were at The House a lot, so much so that many of us started to comment that we felt like we were stars in a reality TV show, except without the histrionics and sleeping around. Actually, though, we all got along very well. No cliques formed and I think we were all happy to share a table, a paceline, or a couch with anybody else in the group.

Our last day's ride was rained out. A few people went for a run. A few waited for a break in the weather but still got rained on while riding. A few of us went to a café. Nobody seemed to be "climbing the walls." I drove there so I could have cut out a day early, but by day four I was in no hurry to head home... besides there was our one meal "out" to look forward

to. The Cycling House had become home away from home and a chance to truly "check out" of daily life, as we normally know it. So what if the last day's ride was rained out? I read a book, enjoyed pleasant conversations with cool people, and relaxed instead! That is luxury!

In the end, my five days at The House were a true vacation. I got to do something I really enjoy. I hung out with fellow athletes, all of them totally non-pretentious and able to converse about lots of non-cycling topics. I learned some really great stuff, like how to make and use a "four hour bottle" (four scoops of HEED and four scoops of Perpetuem, all sipped carefully to last an entire 4-5 hour ride), how to use the Globus unit help my quads recover, and how important and effective it is to take fueling and supplementation seriously-on and off the bike-and be consistent about it. (How often can one feel the benefits of anything in just a day or two or three?) Best of all, I completely "tuned out" the rest of the world and just enjoyed my life as a cyclist for five days. Hammer Camp at The Cycling House will have to be an annual ritual at the very least.

Chris Kostman produces ultra endurance events in Death Valley and beyond through his company AdventureCORPUS. Info at www.adventurecorpus.com. He wrote about "Ironman Revisted" in Endurance News #56 and was profiled in Endurance News #44. He has used Hammer products since 2000.

HOT TIPS

The pre-race meal

It takes approximately three hours after a carbohydrate-containing meal for elevated insulin level to return to pre-meal or waking fasting level, which is exactly where you want it when you are about to start a workout or race lasting longer than 60-90 minutes. To the degree that insulin is elevated at the start of a workout/race, the faster the body spends its muscle glycogen for energy production. The lower the insulin level at the start of the event, the better your body spares available muscle glycogen stores. Research confirms that time-to-fatigue at aerobic pace is longer with pre-exercise fasting insulin level than elevated insulin level.

ATHLETE SPOTLIGHT

Michael Emde



Photo - Chris Kostman

Steve Born

Our "Spotlight Athlete" for this issue is 37-year-old cyclist Michael Emde, from Spokane, Washington, and to say this guy's got the Furnace Creek 508 race figured out is the understatement of the year. Check out these results he's accrued in his three attempts at the epic ultra endurance cycling event:

- * 2005 - 3rd place - 27:49:07
- * 2006 - 1st place - 28:23:31
- * 2007 - 1st place - 27:32:30

Now, to finish this race is an accomplishment in and of itself; to go three-for-three, with no finish lower than third place is, as the saying goes, "the stuff that legends are made of." Michael's time in his repeat victory in 2007 is the third fastest time in race history, and it established a new Men's 30+ course record.

Michael and his wife Marla operate Emde Sports (www.emdesports.com), where they provide coaching services and produce a number of events, such as the hugely popular Valley Girl Triathlon (www.valleygirltri.com), the West Plains WunderWoman Triathlon (www.emdesports.com/wunderwoman-triathlon/home.html), and the Inland Northwest Cyclocross Series (www.emdesports.com/Race_Flyers/2007_cyclocross.html), all of which Hammer Nutrition enthusiastically sponsors. In addition, the Emde Sports/Fitness Fanatics Cycling and Triathlon Club is one of the premier racing teams and clubs in the region.

STEVE: Michael, congratulations on your repeat win at the Furnace Creek 508; another great race. Of the two 508's that you've won, which one would you say was more satisfying, and why?

MICHAEL: Thanks Steve. Both the 2006 & 2007 editions are special but in different ways. In 2006 I crashed while leading the race just past Trona, and with 330 miles to go, I wasn't even thinking of winning. Just finishing was going to be enough! The pain in my hip flexors was starting to really get intense, and the roads in the Mojave Preserve were making matters even worse, beating up my already battered body. Once the race was over, it was difficult to enjoy the victory, having to take care of wounds and trying to comfort my body. I realized weeks later what I had really achieved. This race was special because of the challenges presented while overcoming the difficulties we encountered. We still won—that was the amazing part. Many would have abandoned the race, but that just wasn't an option for me.

The 2007 race was challenging because I was the defending champion and I was feeling a bit like people would be watching out for me more this year. I really wanted to have a good clean race without mishaps, so I was mentally really geared up for this race. The winds seemed a bit worse this year, with 30-35mph headwinds and crosswinds; times were slower compared to last year early on. I was calculating that my time would be closer to 29:00 to 30:00 this year. Eventually things shifted; heading up Townes Pass I found a good rhythm, and through Death Valley we had slight tailwinds for quite a few miles. We made up some time, so I kept on the pace. I had some time to think out there, and I calculated that a new overall course record actually could be within reach! By the time we got to the finish line, we just missed the record by about 15 minutes, though the race was longer this year by 1.5 miles. Unlike the year before, we did get to enjoy the race victory and the

special moment that comes with it. It was a great feeling that I repeated as the defending Champion and that FC508 was a UMCA World Cup Race.

STEVE: You're now "three for three" in terms of finishing this grueling race. You've taken 3rd place and have two wins... that's got to be quite satisfying.

MICHAEL: It is very satisfying! I have a lot of respect of the FC508 course! 508 miles is a long way to race, and many things can happen in that environment, which makes it even more challenging. There is only one goal I have before I enter each FC508-finishing. Seriously. No one really believes that statement, but it is true. Finishing in the top three or even winning is just icing on the cake. A lot of things can happen in 508 miles, as you can see from my 2005 and 2006 races, and finishing is always the primary goal. I've spent a lot of time, effort, and money to get myself and my crew to this race, and a DNF is not an option.

STEVE: Tell us a little about your athletic/cycling background, prior to your involvement in the Furnace Creek 508.

MICHAEL: I started riding a bike when I was 15 years old back home in Vienna, Austria in 1984. Back then I thought a 30-mile ride was a long day. I applied for my first racing license when I was 18 (in 1987), which was a rude awakening and a humbling experience for quite a few years. When you get dropped 3 miles in to a 100+ mile race, you realize very quickly how tough of a sport cycling is. I found a mentor and friend in Christian Langhammer, a track racer from Vienna, who gave me valuable training advice. I had some successes while racing in the

see LYNNE on page 29

LYNNE from page 28

amateur ranks, and my break through success came in 1993 when I finished 4th at the Austrian National Points Race Championships. During this year I also met a blind athlete, Norbert Stuchetz, who had intentions of trying his legs at bicycle racing. Norbert and I went to the Austrian National Blind Assoc. Cycling Championships and surprised everyone by winning the time trial and later two championships the following year! In 1994 I focused on tandem racing with my blind stoker and we qualified for the I.P.C. World Championships in Belgium. We raced 4 events both on the track and the road and placed 3rd in the track match sprint with some other top 6 places during our first World Championships! During this event I also met my future wife Marla, who was a member of the USBA Team. Luckily, Marla and her stoker competed in the mixed class! For me to say Belgium was great success would be an understatement!

In 1995 I moved to Spokane, WA. I have raced competitively in the Pacific Northwest for the last 12 years as a Category 1 cyclist. I had a brief racing break for a year when our daughter was born in 1996. Racing in the NW has been fun and rewarding over the years, and I certainly couldn't do it with the support that Marla provides!!! I have multiple state championships, a national championship in the 24-hour MTB Masters Team Nationals, a BAR Championship (best all-around rider, WA State 2006) and hundreds of top-ten finishes as a CAT 1 racer. I race my bike because I am competitive and I have FUN riding and racing my bike.

STEVE: When did you first get "bitten" by the ultra cycling "bug"? Which race or races did you do that made you believe you could excel in ultra cycling races?

MICHAEL: There is no race or event in particular. In Europe I raced some marathons that were 200-250km, so I've been used to some endurance for quite some time. Most of the races in Europe are much longer than the races here in the U.S. I always excelled more on the endurance side of cycling. During 1987 Franz Spilauer competed in RAAM, and he was the first European to finish

RAAM; I read his book front to back and back to front. It was very fascinating and intriguing. He went on to win the 1988 edition. I guess during that time I thought that it would be a great experience to race RAAM, but destiny took me down another path. I did some 24h MTB races, but I don't really train on the mountain bike or work on my skills, so I prefer to stay on the road. The first race that proved to me that I could do well in Ultra Cycling was the 2005 FC508.



Michael crosses the tape for his second Furnace Creek 508 win

Photo - Chris Kostman

STEVE: The 2005 edition of the Furnace Creek 508 was one of the truly epic races in the long history of this race, with the first five finishers breaking the existing course record (28:09:34 posted by Rainer Klaus in 1995). Obviously, you would have liked to win, but were you still satisfied with the race?

MICHAEL: If someone would have told me prior to the 2005 race that I would be finishing third and setting new course records, I would have said, "Thank you very much; I'll take it." Yes, I was very satisfied especially considering the high level of competition with Kenny Souza, Tinker Juarez, Andrew Bohannon, and Rick Ashabranner. All of these athletes are well known in the Ultra Cycling and endurance worlds. Again, we just wanted to finish and gain experience our first year.

STEVE: You led the field for slightly over half the race and seemed to have control of the race. However, somewhere after the Furnace Creek time station (Mile 252) you fell behind Kenny Souza. After that, between Mile 382 and Mile 416 (time stations 5 & 6), eventual second place finisher Tinker Juarez passed you. Were you having any physical problems that caused this? Or was it mechanical problems with either your support vehicle or bicycles? How did you react after being passed?

MICHAEL: The 2005 race started out great. I was and felt prepared and started riding my own tempo on the climbs and soon found I was leading the race. After about 100 miles Kenny Souza passed me just before the Randsburg climb and I re-passed Kenny on the climb. In the Panamint Valley, Kenny flew by me and Eric Ostendorf encouraged me from the side of the road to stay with him. I kept my own pace on the flats knowing that Townes Pass was just around the corner. I knew I was climbing better than Kenny, so I was patient. Sure enough, we saw Kenny just before he crested the summit and we overtook him at Stovepipe Wells. Kenny and I were the first athletes ever to race in to Death Valley in daylight hours. Just a few miles outside of Furnace Creek, as night fell, Marla called me on the race radio and told me to stop. At first I didn't understand her and told

her I didn't need to stop. Again, she let me know that I had to stop and I found out that the amber flashing rear lights (mandatory) had burned out the fuses in the van. Disaster had struck... how could that be? I borrowed some of the best lights available and something still happened. We made it in to the Furnace Creek time station one minute before Kenny Souza.

We found [race director] Chris Kostman and consulted briefly with him about our situation. I suggested to my crew that if we can't have lights, we'll finish the race out the following morning during daylight hours and we could spend the night in Furnace Creek. That was a bad suggestion on my part as Marla sent me away (confident they would get things fixed) and told me to sit down somewhere

see MICHAEL on page 30

MICHAEL from page 29

to relax. She and the crew replaced the bad fuses from other “non essential” good fuses and after about 25-30 minutes we were on the road again. At this point, we entered back into the race with Kenny upfront and Tinker Juarez just behind us. The climb up Jubilee and Salsberry Pass was great from my point of view, but unfortunately the vehicle lights weren’t the only problem that I would encounter during that night.

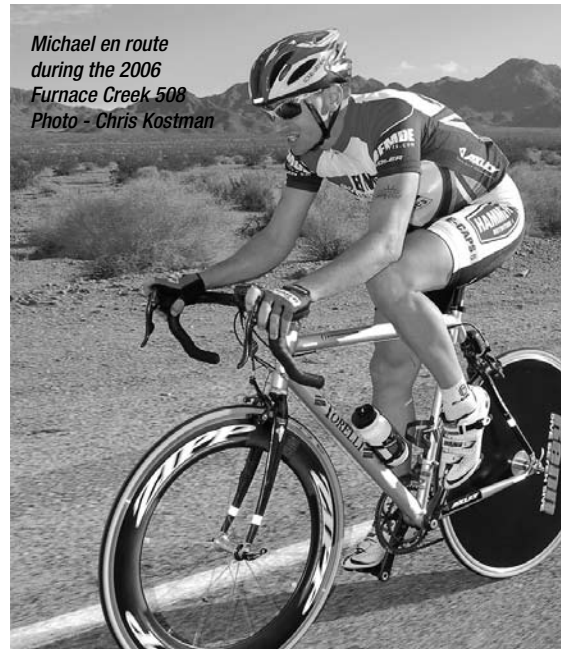
Just about 10 km outside of Baker my stomach started to feel bloated, and since we had to stop in Baker to gas up anyway, I used the bathrooms there. I won’t give you the details on this one! After leaving the bathrooms I saw that Tinker and his crew was rolling in to Baker to gas up and realized I had spent 15 minutes in the restroom. Outside of Baker is the Kelbaker Grade where I gave a brief interview with Chris Kostman, and then stopped again near the summit to visit with Mother Nature. I waited for Tinker to come by, wished him good luck, and off into the bushes I went. My gut wasn’t bad enough to slow me down too much, but it was pretty uncomfortable for a while. We chased things down with some pretzels and water for a while and things started to slowly improve. From there on it was just damage control on my part with the last 100 miles being chased by Andrew Bohannon (a two-time winner of this race) and trying to hold on to third place. In the end, I was able to finish under 28 hours and come in third, but I knew that I had the potential to challenge for a victory on a better day. All things would have to fall in to place.

STEVE: What did you learn after that first race that helped you in achieving your two outstanding wins the next two years?

MICHAEL: Marla and I returned from the trip, and during our recovery period, when things were still fresh in our minds, we dissected every part of our 2005 FC508 race. We made some small changes with my race nutrition, tweaked my position on the bike slightly for a race of this distance, and purchased new amber flashing lights! We would also organize the inside of the van a bit differently for 2006. Marla had all the

details written down and made notes during the race. Did I tell you already that she is awesome?

We studied other racers, analyzed their riding styles and equipment, and had a discerning eye for what was working and what wasn’t. Knowing your competition is a big benefit, so I do my homework there. I try to be prepared for every situation that may arise during the race. It drives my team nuts when I show up



with 10 different wheels in the back of the van! Marla and I read every possible Internet report to scout out every bit of information, and I also had great feedback and course information from you.

STEVE: Marla, from a crew standpoint, what have you learned from that first race and what did you and the other crew members do differently to help Michael achieve his two wins?

MARLA: I think one of the things that added to the difficulty of the race in our first FC in 2005 was navigating the course. Not having seen the exact course, reading and re-reading the directions to make sure we don’t take Michael the wrong direction was kind of demanding. We had studied the course prior to the race, but actually seeing it and how to race it is a great thing to have under your belt. Michael had the utmost confidence in the course going

in to the 2006 race. From a nutritional standpoint, we were very close the first time through and had to make only some small adjustments the next year with water intake. Otherwise, having a crew chief is very important-someone who will make final decisions when needed and who will take ultimate responsibility for Michael’s safety and well-being. That is my position, and it gives the rest of the crew a sense of relief, I think. Also, Michael trusts me and that needs to happen so he can relax and just ride the bike. We haven’t really changed our approach much over the last three years. We both have a long history in racing and cycling, and those experiences lend themselves well to having positive new experiences.

STEVE: There’s a saying in the ultra cycling world that the crew can’t win the race for you, but they can lose it for you. Do you believe that, and how much did your crew factor in to your high finishes in the 508?

MICHAEL: Yes! But I guess I have more than a crew, I have a great team! I’m certainly part of a team, and I see FC508 as a team effort. Without my team I cannot function out on the roads or even attempt this race. They know that I put total trust in whatever they do and I relinquish any control before,

during, and after the race to them. I realize that I receive the recognition for the race, but in reality I have the easy job; I just have to ride the bicycle. We ALL work hard for our success. We also observe the other competitors crossing the finish line in Twenty Nine Palms to watch what they’re doing and observe. We work on making our team the best we can be.

STEVE: Finishing a race as hard as the Furnace Creek 508 is, to most competitors, a primary goal. Yet you’ve not only finished it, you’ve finished well under that “magical” 30-hour mark that so many riders aim for... in other words, you’ve made it look pretty easy! With that in mind, is there a particular part of the race-either one of them or all three of them combined-that you dislike the most? What part of the race is the hardest for you and why?

see MICHAEL on page 31

MICHAEL from page 30

MICHAEL: I'm not sure if I would say that it is easy, I look pretty exhausted in those photos right after the race. It does help that I love to ride in the desert, so I don't really dislike any part of the race course. I would actually have more trouble naming my favorite part on the FC508 course; there are too many to name.

The hardest part for me during the race is from Sheephole to Twenty Nine Palms. At that point I'm ready to be done, my whole body starts to ache and there is usually a stiff headwind just to top it off. I have a special quote to get me through the rough parts and the people that know me and get e-mails from me know this one:

"There is nothing impossible to him who will try" - Alexander the Great

If this worked for one of the greatest conquerors, it should work for me!

STEVE: In preparation for this race, what kind of training did you do? During peak training periods, what did "a week in the life of Michael Emde" look like?

MICHAEL: Well, I suppose a lot of people would like to get their hands on this information (laughs). Let's just say that I only do a handful of rides over 150-200 miles. I think that my racing in the early season is a big part of my success, and the accumulation of miles in my legs over the years is a major factor as well. Having a comfortable position on the bike is very important.

STEVE: You've obviously placed a lot of emphasis on supplementation and fueling. What Hammer Nutrition supplements and fuels did you use regularly in your training?

MICHAEL: We've used different things in different years, but we've always tested them to make sure they work for me. It depends on what my taste is for at that particular time of year. We use exclusively Hammer Nutrition products, including Perpetuem, Sustained Energy, Hammer Gel, HEED, Liquid Endurance (if the temperature changes are great enough), Race Caps Supreme and of course, Endurolytes. All of the Hammer Nutrition products are great for ultra racing.

STEVE: Marla, you've been Michael's crew chief on all his 508 efforts. What was his supplement/fueling protocol for this past Furnace Creek 508 and did it differ from previous years? Did you add any Hammer supplements or fuels after his first 508 and/or did you change anything regarding his supplement and fueling strategy since that first year? Finally, what supplements and fuels did he use this year, and can you give us a short rundown of how often he used specific Hammer supplements or fuels?

MARLA: All of our products have been pretty much the same each year. We added a bit more water after the first year and we fed him about 250-275 kcal per hour or about 60-65g of carbohydrates per hour of Hammer Products such as Perpetuem or Sustained Energy. He used Hammer products almost every hour of the race.

STEVE: Now that you've got three phenomenal 508's under your belt, is there a Race Across America (RAAM) in your future? If so, when do you see that happening?

MICHAEL: We had plans for a 2008 RAAM, but Marla got an outstanding job offer at the Spokane Regional Sports Commission that I really wanted her to take. We also promote a popular triathlon (the Valley Girl Triathlon) in July, and RAAM is only a month before that race. That is cutting things a bit short on our end. I do want my spouse and crew chief with me during an adventure like RAAM, and she would want to be there with me.

STEVE: What are the biggest obstacles you see in considering a shot at RAAM?

MICHAEL: Finances are obviously a big part. I know riders/ racers have done it on a shoestring budget, but if I only do it once, I would like it to be a memorable experience for the whole team. The other obstacle would be to get the time off from my part-time job at FedEx. Unfortunately their vacation policy is very strict. I would also require a fantastic team... by the way, are you available? (laughs). Really, if RAAM happens, that would be great, and if it doesn't, that is fine, too. I'll just keep doing the 508, since I do enjoy it.

STEVE: What advice would you give for anyone wanting to compete in and complete an ultra distance race like the Furnace Creek 508?

MICHAEL: Read and learn as much as possible about the FC508! The more knowledge you can gain, the better. Ride consistently, keeping in mind that you don't have to put in mega miles. As long as you can ride six days a week, you can make it work. A century ride for some can be a daylong adventure and for others just a normal 5-hour ride. It also depends on how long you've been riding. It may be that you train for this over a two-year period, instead of one. Be realistic on how many miles you've got in your legs. Do some hard century rides and a few double centuries first. Test out your nutrition and hydration and get the crew trained. Ride a few times during the night just to get used to it. Work with your crew a few times prior to the race so they know how to hand-off bottles and how to follow closely at night. Experiment and have fun doing it!

STEVE: Michael, thanks for your time. From all of us at Hammer Nutrition, congratulations again on another spectacular win at Furnace Creek. Best wishes to both of you for a most successful 2008 in both your racing and with Emde Sports!

MICHAEL: Thanks, Steve-and the entire team at Hammer Nutrition. You guys are awesome!

HOT TIPS

Carry a jug of gel!

Adventure racing? Carry a full jug of Hammer Gel with you! Adventure racers know that economy of weight is a crucial component for success... you want to carry as much essential equipment as you can, as conveniently and compactly as possible. When it comes to fuel, carrying a full jug of Hammer Gel (or two, depending on the length of your race) is a great way to have a lot of calories at your fingertips but without taking up much space at all. A full jug of Hammer Gel contains at least 8 hours worth of fuel and the more you use it the lighter it becomes. Plus, empty Hammer Gel jugs work great as water bottles.



24 Helpful Hints

Increase lean muscle mass and lose extra body fat

Photo - Mike Hone

Bill Misner, Ph.D.

Everyone should be thinking now about how to achieve early “fighting weight” before the competitive season arrives. The holidays tend to add 5-9 lbs extra body weight, which tend to slow down ascents and prolonged performance significantly. Every year this extra “padding” seems to grow rather than disappear completely.

A synopsis of principles + helpful hints We scientists are not ignorant that it is difficult to motivate non-scientists to read or attempt to interpret lengthy collected research data that conclude findings, associations, and generalizations. For those of you who want to know what works, what does not work, and how to naturally settle into your “fighting weight”, the following Principles and Helpful Hints are listed:

Effective weight loss principles
Total calorie intake is the cause of weight gain. Total calorie expenditures are the cause of weight loss. A calorie-restriction weight loss intervention must include balance menu, safe if dietary supplements are used, and gradual weight loss, followed immediately by a planned commitment to permanent healthy “Lifestyle” change.

The effectual weight management program emphasizes lifestyle-training modifications with each of the following goal principles:

*** GRADUAL CHANGE** to healthful eating patterns characterized by increased intake of whole grains, seeds, nuts, fish, fruits, and vegetables, with a decrease intake of high saturated fat foods, and processed empty-calorie foods.

*** NONRESTRICTIVE EATING** is based on internal regulation of hunger pangs, which reduces calorie overdose

by increasing frequency of small-portion nutrient-rich, calorie-sparse plant foods.

*** MAKE PHYSICAL ACTIVITY ENJOYABLE** emphasizing and gradual well tolerated to achieve a minimum of 30 minutes exercise daily.

*** SET REALISTIC GOALS** that focus on healthful eating practices and increased physical activity. Goals include halting weight gain first, stabilizing weight second, and weight loss lastly as a natural outcome of activity’s effect generating a small calorie-deficit. The end reward is significant impact effect on health.

*** EAT A VARIETY OF FOODS** Choose small portions from whole grains (6-11 servings), vegetables (3-5 servings), and fruits (2-4 servings) including (2-4 servings) from a non-animal protein source (fish, nuts, beans, legumes, sprouts, seeds). Limit amount of food to small portions. Limit foods that lack nutrients or are high in fat and processed sugar.

*** BALANCE CALORIE INTAKE WITH ACTIVE CALORIE EXPENSE** Complete a minimum of 30 minutes moderate aerobic physical activity daily.

*** FOOD CHOICES: WHOLE GRAINS, VEGETABLES, AND FRUITS** These include high complex carbohydrate whole grain bread, whole grain cereal, whole grain pasta, rice, potatoes, corn, broccoli, Brussels sprouts, carrots, onions, garlic cloves, cauliflower, pinto, navy, kidney, and black beans.

*** FOOD CHOICES: CHOOSE LOW TOTAL FAT, LOW SATURATED FAT, AND LOW CHOLESTEROL FOODS** Some foods and food groups are too high in fat. Fats and oils, and

some types of desserts and snack foods that contain fat provide more calories than necessary nutrients. Certain foods should be limited: milk, meat, eggs, poultry, processed grains. These foods elevate homocysteine, saturated fat, and blood sugar resulting in calorie excess. “Limited” implies consuming small portions no more than 1-2 times per week.

*** FOOD CHOICES: FOODS LOW IN SIMPLE SUGAR AND LOW GLYCEMIC INDEX** Evidence shows that foods high in simple sugar or with a high glycemic index contribute to weight gain, hyperactivity, and potentially insulin resistance syndrome, or diabetes. The most common type of diabetes occurs in overweight adults. Avoiding sugars or high glycemic foods alone will not correct overweight. Weight loss and weight control depends on total calorie intake and calorie deficits created by the level of physical activity.

*** FOOD CHOICES: CHOSE LOW SODIUM FOODS** Sodium plays an essential role in regulation of fluids and blood pressure. Many studies in diverse populations have shown that a high sodium intake is associated with higher blood pressure. Most evidence suggests that people at risk for high blood pressure reduce their chances of developing this condition by consuming less salt or sodium.

Tell me what to do and what to do not!

Most people will naturally migrate to their natural-healthy body weight by regular daily exercise following the DO’s and DO NOTS’ of this weight management lifestyle:

1. DO reduce carbohydrate calorie intake

see *HINTS* on page 33

HINTS from page 32

by 30-50%.

2. DO increase plant foods, vegetable and fruit intake by 25-33%.

3. DO replace fluid losses starting with 1-1.3 fluid ounces per kilogram or 0.5-0.7 fluid ounces liquid per pound body weight per day.

4. DO limit calorie intake later in the day; consume last meal 3 hours prior to bedtime. (This does not imply that calorie timing neglects total daily calorie intake.)

5. DO reduce excess fat calories from meat, dairy, or dairy byproducts.

6. DO prolong aerobic exercise or frequent short anaerobic exercise to increase the rate of weight loss daily.

7. DO restrict calorie weight-loss periods to 3 weeks length resulting in small gradual weight loss then include a reward of 3-7 days "Vacation" options to a menu plan that includes both no calorie-restriction and no calorie-excess controls.

8. DO limit weight loss rate to 0.5-1.0 pound weight loss each week.

9. DO consume a minimum 1,500 (+/- 300) calories per day during calorie restriction periods only.

10. DO limit fatty meats and processed food calories.

11. DO consume a variety of nutritionally balanced foods in calorie-restriction protocols.

12. DO set realistic weight loss goals that result in slow, moderate body mass change (avoid setting immediate unrealistic goals).

13. DO NOT adopt temporary dietary protocol apart from a permanent "Lifestyle" change.

14. DO NOT impose hunger severity initiating stages of starvation.

15. DO NOT allow rapid weight loss, which has been implicated in the fast weight regain in the off-season.

16. DO NOT take stimulants, steroids, or

diuretics.

17. DO NOT diet with excess protein above 1.6 grams protein per kilogram (> .75 grams/lb) body weight.

18. DO NOT diet with an excess intake of foods rich in saturated fat from dairy, animal, or poultry byproducts.

19. DO NOT consume excess amounts of packaged or fast foods.

20. DO NOT attempt a weight management lifestyle without regular daily exercise.

21. DO NOT eat foods with processed Trans Fatty Acids (TFA) also called partially or completely hydrogenated vegetable fats; found in many packaged foods and processed baked goods.

22. DO NOT DRINK ALCOHOL: Alcoholic beverages supply high calories but few nutrients. These effects of alcohol alter judgment and can lead to dependency and a great many other serious health problems. Experimental evidence from several metabolic studies showed a suppression of lipid oxidation by alcohol and thus the enhancement of a positive fat balance. The non-oxidized fat is preferentially deposited in the abdominal area. The experimental metabolic evidence suggests that the consumption of moderate amounts of alcohol has to be accounted for in the energy-balance equation and may represent a risk factor for the development of a positive energy balance and thus weight gain. Higher levels of alcohol intake raise the risk for high blood pressure, stroke, heart disease, certain cancers, accidents, violence, suicides, birth defects, and overall mortality (deaths). Alcohol may increase the risk of liver cirrhosis, inflammation of the pancreas, or damage to the brain and heart. Heavy drinkers also are at risk of malnutrition because alcohol contains calories that may substitute for those in more nutritious foods. Alcohol neutralizes anabolic hormone affects in muscles following exercise.

23. DO NOT eat excess calories above calorie expenditures more than 1 meal per week.

24. DO NOT eat high amounts of carbohydrates except after intense workouts.

*CARBO LOAD from page 30***Nonoxidative glucose disposal**

18.5% glucose polymer	3.51 mmol/kg/h
18.5% sucrose	2.96 mmol/kg/h
12% sucrose	2.97 mmol/kg/h

Muscle glycogen storage

18.5% glucose polymer	5.31 mmol/kg/h
18.5% sucrose	4.07 mmol/kg/h
12% sucrose	3.45 mmol/kg/h

sucrose (wt/vol). The respective results are listed above.

Conclusion

Both parameters measured higher with glucose polymer than sucrose, a simple sugar. The results suggest that consumption of a glucose polymer (maltodextrin) drink promotes a more rapid storage of carbohydrate as muscle glycogen in the whole body, skeletal muscle in particular, than an iso-energetic sucrose drink.

Reference:

J Appl Physiol 2000 May; 1988(5): 1529-36.

Summary

Steve: I am convinced that the very best way to prep your body for upcoming workouts and races is via what you do in the first two hours (ideally the first 60 minutes) after exercise has been completed. That's the "window of opportunity" that most of us have heard about, the time your body lets you know that if you give it some nutritional support (in the form of carbohydrates and protein), it'll reward you by storing more of a premium fuel, muscle glycogen, in the muscles. As you become fitter, and the more consistently you refuel immediately post-workout, the greater the muscle glycogen stores you'll accrue. Remember, this is important to endurance activity because muscle glycogen is the first fuel your body will utilize when exercise commences. There is no question that maximized muscle glycogen at the starting line gives you a definite advantage over a competitor who hasn't been conscientious about immediate post-workout refueling.

Dr Bill: Recoverite is formulated with long-chain maltodextrins as its select source of complex carbohydrates. In other words, No Added Simple Sugars! Why work harder if you can work smarter?

Chromium

"Trace" by classification only!

Steve Born



Chromium may be listed as a trace mineral, but its importance for general health and athletic performance is anything but minuscule. Chromium helps insulin regulate blood sugar levels; supplementation tends to decrease blood sugar in people with high blood sugar levels and raises blood sugar in people with low blood sugar levels. It improves the uptake of cellular glucose for energy production. For weight management purposes it's believed that chromium inhibits the synthesis of new fat from carbohydrates, which frees the mitochondria to burn already-stored fat. This is one reason we include this nutrient in Appetat, our weight management supplement (and hydroxycitric acid, too, for the same reason). Chromium also helps overcome sugar cravings, a problem many people experience, especially those who have diets high in sugars and refined carbohydrates. Chromium concentrates in the brain, adrenal glands, and muscles, and can increase lean body mass.

Perhaps the most exciting news regarding chromium came courtesy of a study presented at the 46th Annual Meeting of the American College of Nutrition in September 2005. In this study ChromeMate™ brand chromium polynicotinate (which is the only type of chromium we use in our products) demonstrated its ability to prolong the life span of test animals by more than 22%. According to the study, conducted by researchers at Georgetown University Medical Center (Washington, DC) and Creighton University Medical Center (Omaha, NE), rats prone to aging were fed diets containing ChromeMate™, which increased their average life span by +22% compared to rats fed the same diet without ChromeMate™.

Rats fed ChromeMate™ also experienced:

1. Lower systolic blood pressure
2. Lower circulating glucose levels
3. Lower, normalized hemoglobin levels, a long-term indicator of blood sugar status
4. No abnormalities in blood chemistry, kidney or liver function

If you're a rat, chromium supplementation is a no-brainer, which is fortunate, because if you're a rat, you don't have much in the way of a brain, anyway. However, there's a good case to be made for human supplementation as well, because approximately half the world's population (including Americans) is deficient in chromium. Some experts believe that Americans ingest less than 50% of the recommended daily amount of chromium. The reason may be partly due to increased consumption of calorie-rich but nutrient-poor processed foods. Food grown in nutrient-depleted soil is another culprit for widespread chromium deficiency. A sobering fact, according to the 1992 Earth Summit report, is that in the past 100 years, North American soils have been depleted of 85% of their mineral content. That's why it's not surprising that the foods we consume are deficient in a number of minerals, chromium included. This, along with a nutrient-poor diet, might contribute to the ever-increasing rate of diabetes in the US.

Dr. Bill writes, "Phosphorus-rich foods and diet sodas bind with chromium in the digestive tract to form chromium phosphate that travels through the intestines and is excreted without being absorbed. Some speculate vanadium interferes with the function of chromium. Excess table sugar, zinc, and iron tend to reduce chromium levels. Endurance

exercise and stress also rapidly deplete your reserves in sweat, urine, and fecal excretion. The average daily loss (excretion) of chromium from the body is 9 mcg, primarily via urine. However, I have read sweat loss can increase losses by a whopping 600%+!"

Needless to say, with the food supply and average dietary practices yielding inadequate amounts of chromium, it's vital to supplement with this trace mineral in order to obtain acceptable amounts and reap maximal benefits. Original recommendations were a daily intake of 200-600 mcg. However, more current research indicates that higher amounts of chromium-up to 1000 mcg daily-may be required to obtain the best benefits for improved blood sugar control, cholesterol, and insulin.

In addition to the 200 mcg provided by a daily seven-capsule dose of Premium Insurance Caps, taking additional chromium with post-workout fuel and at every meal is a sound strategy for providing numerous benefits. An inexpensive investment of \$9.95 for a bottle of 100 capsules of Hammer Nutrition ChromeMate is a wise move for your health.

REFERENCES:

- Anderson RA. Essentiality of chromium in humans. *Sci Total Environ*. 1989 Oct 1; 86(1-2): 75-81.
Available at: <http://www.earthsummit.info>. Accessed March 9, 2006.
- Anderson RA, Cheng N, Bryden NA, et al. Elevated intakes of supplemental chromium improve glucose and insulin variables in individuals with type 2 diabetes. *Diabetes*. 1997 Nov; 46(11): 1786-91.
- Bahijiri SM, Mufti AM. Beneficial effects of chromium in people with type 2 diabetes, and urinary chromium response to glucose load as a possible indicator of status. *Biol Trace Elem Res*. 2002 Feb; 85(2): 97-109.
- Bahijiri SM, Mira SA, Mufti AM, Ajabnoor MA. The effects of inorganic chromium and brewer's yeast supplementation on glucose tolerance, serum lipids and drug dosage in individuals with type 2 diabetes. *Saudi Med J*. 2000 Sep; 21(9): 831-7.
- Wilson BE, Gandy A. Effects of chromium supplementation on fasting insulin levels and lipid parameters in healthy, non-obese young subjects. *Diabetes Res Clin Pract*. 1995 Jun; 28(3): 179-84.



Bill Misner, Ph.D.

I am aware of several reports supporting use of this milk protein, such as chocolate milk as a recovery drink, for exercise applications; however, casein is not a source of protein I can recommend.

Summary of anti-casein rationale

- Biological values of casein is 77 compared to whey's 104
- Excess casein (in animal studies) reduces life expectancy
- Excess casein (beta-casein A1 form) increases the risk of atherosclerosis
- Casein is responsible for allergy onset
- Excess casein increases cholesterol
- Casein contains gluten and may exacerbate the symptoms of autism
- Casein is not a singular entity but consists of varying amounts of three casein sub-fractions, alpha, beta, and kappa-casein. Beta-casein A1 differs from beta-casein A2 by the substitution of the amino acid histidine at position 67, and is responsible for most of the negative effects of casein. Beta-casein A2 has the amino acid proline at position 67 and is not considered a health risk.

Biological Value

The standard biological value (BV) upon which other foods are measured is whole eggs, with a BV of 100. Most foods have a lower BV compared to whole eggs. Only a few foods have a higher BV than whole eggs (such as Whey). Biological Value (BV) is a measurement of the amount of protein retained in the human body per gram of protein absorbed. The higher the biological value of a given food or supplement, the greater the retention of its constituent protein. The biological value of casein is 77. It is a phosphoprotein, containing phosphates as members of its amino acid side chains. Casein enhances absorption

of dietary amino acids (and the dietary proteins from which these amino acids are derived). Casein increases the transit time of dietary proteins through the gastrointestinal tract because casein forms a gel-like consistency within the gastrointestinal tract that tends to slow down its transit time.

Atherosclerosis (the hardening and narrowing of the arteries) beta-casein A1 is atherogenic compared with beta-casein A2

Casein is a major protein in cow's milk that occurs in several variant forms, two of which are beta-casein A1 and beta-casein A2. The levels of these two proteins vary considerably in milk, depending on the breed of cow. Epidemiological studies suggest that there is a relationship between their consumption and the development of atherosclerosis. In the present study, the direct effect of consumption of beta-casein A1 vs beta-casein A2 on atherosclerosis development was examined in a rabbit model. Sixty rabbits had their right carotid artery balloon de-endothelialised, divided randomly into 10 groups (n=6 per group), then for 6 weeks fed a diet containing 0, 5, 10 or 20% casein isolate, either beta-casein variant A1 or A2, made up to 20% milk protein with whey. Some groups had their diets supplemented with 0.5% cholesterol. Blood samples were collected at 0, 3 and 6 weeks and rabbits were sacrificed at 6 weeks.

In the absence of dietary cholesterol, beta-casein A1 produced significantly higher ($P<0.05$) serum cholesterol, LDL, HDL and triglyceride levels than whey diet alone, which in turn produced higher levels than beta-casein A2. Rabbits fed beta-casein A1 had a

higher percent surface area of aorta covered by fatty streaks than those fed beta-casein A2 (5.2 ± 0.81 vs 1.1 ± 0.39 , $P<0.05$), and the thickness of the fatty streak lesions in the aortic arch was significantly higher (0.04 ± 0.010 vs 0.00 , $P<0.05$). Similarly, the intima to media ratio (I:M) of the balloon injured carotid arteries in A1 fed animals (0.77 ± 0.07) was higher than in those that consumed A2 (0.57 ± 0.04) or whey (0.58 ± 0.04), but this did not reach significance. In the presence of 0.5% dietary cholesterol, the thickness of the aortic arch lesions was higher ($P<0.05$) in 5, 10 and 20% casein A1 fed animals compared with their A2 counterparts, while other parameters were not significantly different. It is concluded that beta-casein A1 is atherogenic compared with beta-casein A2 (Redgrave 1984; Tailford 2003).

Autism

Casein may exacerbate the symptoms of autism. Some practitioners recommend that autism patients adopt gluten-free and casein-free diets (Millward 2004). It has been suggested that peptides from gluten and casein may have a role in the origins of autism, and that the physiology and psychology of autism might be explained by excessive opioid activity linked to these peptides. Research has reported abnormal levels of peptides in the urine and cerebrospinal fluid of persons with autism. If this is the case, diets free of gluten and /or casein should reduce the symptoms associated with autism.

References

- * Redgrave TG. Dietary proteins and atherosclerosis. *Atherosclerosis*. 52:349-351, 1984.
- * Tailford, K. A., et al. A casein variant in cow's milk is atherogenic. *Atherosclerosis*. 170(1):13-19, 2003.
- * Millward C. et al. Gluten- and casein-free diets for autistic spectrum disorder. *Cochrane Database Syst Rev*. 2004(2):CD003498, 2004.

Commit to wearing number 1 in 2008

Steve Born crosses the finish in 2002 to become the first person to attempt and finish the Double Furnace Creek 508.

Tony Schiller



Tony Schiller

Have you ever thought about the significance of the #1 bib in a race? When you see an athlete wearing the #1, what does it mean?

I like to ask the audience in

my business speeches that question and some of the answers are pretty humorous. My favorite is, "that he/she was the first one to register." Well, not long ago that's exactly what it meant. Doling out numbers on a first-in basis sequentially until the highest bib number was taken was the easiest way to manage a race and know when it was officially "full". There are still a few races using this antiquated approach which calls into question the other shortcuts they might be taking (but that's another story).

Most races today reserve the #1 for the defending champion. In fact, some thoughtful race directors keep the #1 unused when their reigning champion is not able to defend. This is as it should be - it's a classy way to honor an event's history while sending the message to all competitors, "hey, if you want to be so honored and be the one wearing #1, then go win the race."

But this isn't an article for the few who have hope for winning a race and actually wearing the #1. It's an article about the importance of symbolism, its

impact on the power of the mind, and by extension, our physical performance. For instance, do you think you'd feel differently warming up for a race after pinning on the #1 than say, if you'd just pinned on the #2?

Well, logically, you could say, "no", since the physical properties of the ink on a Tyvec bib have nothing to do with the physical properties or attributes of the athlete. You could say that, but you would be wrong. Just ask Jan Ullrich who wore the #1 in the 1998 Tour de France and later was saddled by Lance with the #2. The symbolism of both the #1 and the #2 are so powerful in racing and in our conscious and sub-conscious minds that wearing each number sets off vastly different chemical reactions throughout the nervous system, and as a result, very much alters the athlete's actual physical existence too.

The reason I find this topic so fascinating - and why it is so relevant to you as you plan for 2008 - is this: Regardless of whether you see yourself wearing the #1, the #2, or the #1313, the fact is every single day you put on a number. You wear the number tattooed to your very being and it announces how you see yourself stacking up and what you believe you deserve - in racing and in life.

Over the years that number can change. In the beginning of my racing career I saw myself always with a high number. Over time it got lower but took quite a while before I felt ready and deserving of #1. That finally happened - at least here in Minnesota - and for a long time things were very good, until David Thompson came along and changed all that. Now with each passing year, the numbers seem to be getting higher and higher

with the #1 but a fading memory.

But that's circumstances. The challenge is not to let our circumstances dictate what we believe we deserve and for that to transfer to our state of mind. We can still choose that. I was reminded of this again last week when talking to a triathlete I coach, Dale. When we first met couple years back, I asked what his athletic background was to which he replied, "Oh, I'm brand new to this, never really been much of an athlete. Then he added, "I turn 50 this year and my goal is to make some real noise in the age group". "Oh really," I responded, doing my best not to pour cold water on his dream.

Dale was as serious as he was green though and I quickly learned he brought two strengths to the table: first, an amazing coachability with an endless eagerness to learn, and secondly, a child-like belief that anything is possible. It was not my job to burst his bubble, but after watching him struggle to run a mile in over 10 minutes, it felt almost disingenuous supporting his dream. That was a couple years ago. He's now running (his 3rd best event) close to 7:30 per mile over 10k at the end of a triathlon and has won age group awards in several triathlons. For 2008, he is determined to move up in the ranks and fully expects to improve his 10k pace by another minute per mile.

Who am I to say he can't? Dale lived most of his first 50 years believing that as an athlete he deserved a high number. As champions tend to do, he saw his second 50 as an opportunity for a new start and athletically he's been born again. The passion that he is bringing

see TONY on page 37

The 4-hour bottle

Bill cruises along the Going-To-The-Sun Road / Photo : Matt Wingate

Bill Nicolai

Dear Hammer Folk,

I have been doing a lot of long bike rides lately in preparation for ultra events and just because I like to ride. A typical day's ride will cover 120 to 150 miles with 5,000 to 10,000 + feet of climbing which takes from 9 to 15 hours at a moderate pace. This summer I did many such rides totally unsupported and with no backpack, just the contents of my jersey pockets. Here is how it is done:

Make sure you can carry a total of 3 or four bottles, I have 3 on my frame, also you could use two on the frame and a seat back pair. For moderate pace rides you will use less than a bottle of fluid per hour unless it is really hot and then you will use a full bottle per hour. If you are using more than that, back off the speed.

In one of the bottles is my special

four hour fuel supply. It consists of five scoops of unflavored Sustained Energy or Perpetuem and four ounces of Hammer Gel. I use half Espresso and half Raspberry, you can concoct your own special mix. For electrolytes I start off with two Endurolytes per hour and go up to six if it gets really hot. For a 13 hour ride I would carry two small freezer bags with the powder and a couple flasks of Hammer Gel. A Hammer Bar or two for variety and I'm set. I do stop for water once every three or four hours and top off when it is available. Some sunscreen and whatever clothes you will need for the day and you are set to go long.

It has come to my attention that some people don't realize that you can mix the Hammer fuels as think as you like. I've even seen some use them in a very thick paste made in a blender, but I

prefer just a medium thick consistency from five scoops of powder with added Hammer Gel.

Consuming the fuel mixture is easy. I just take a swig every half hour by my watch. In about four hours the bottle is gone and I stop to make another. I have actually done 12 hour rides with only two brief stops.

It isn't haute cuisine, but for a long ride, such a diet always gets me there and I generally don't feel especially tired or depleted. I hope this simple method is of use to your readers.

Best,

Bill Nicolai

TONY from page 36

to every workout is contagious and it's uplifting to have a discussion with him about goals. After having that discussion I realized that regardless of who Dale is racing against, he's choosing to wear the #1 and he does it every day.

How about you? What number will you be wearing in 2008?

Tony Schiller is a corporate motivational speaker, race director and coach. In 2007, he won the men's 45-49 title at the USA Triathlon nationals. He'll go after the 50+ world title this June in Vancouver.

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JAMA Antioxidant Study

An in-depth examination of a flawed report

VRP Staff

Fruits and vegetable are rich in antioxidants

STEVE'S NOTE: While the response to our article "Antioxidant Supplementation - It Will Shorten Your Life!" (Endurance News #54) was overwhelmingly positive, we did receive some emails critical of our unflinching stance on the importance of antioxidant supplementation and the inherent problems associated with the study published in the Journal of American Medical Association. That's why we're providing another article on the subject, one that comes from the respected staff at VRP. After 20 years in the supplement industry, I believe that supplement "bashing" (especially antioxidants) is at an all-time high, which is why this article-reprinted here with permission from the CEO of Vitamin Research Products-is so timely.

There's an old saying in statistics: if you torture the data long enough, statisticians can "prove" almost anything. This means that if you exclude certain studies, lump differing kinds of studies together into the same data pool, set up your own criteria as to what is biased and what is not, and otherwise bend the rules, you can produce a study that says whatever you'd like. And that is exactly what the researchers did in an "anti-antioxidant" study published in February in the Journal of the American Medical Association. [1]

This paper, a meta-analysis produced by a team of Danish, Italian and Serbian researchers, was designed to assess the effects of the antioxidant supplements vitamin A, beta-carotene, vitamin C, vitamin E and selenium on death rates in healthy people and people suffering from a disease or condition. The researchers began with 815 studies, and after excluding 747 of them came to a startling conclusion that contradicted a

wealth of existing scientific evidence: not only were these antioxidants ineffective in reducing mortality, treating people with beta carotene, vitamin A and vitamin E might actually increase mortality!

The media quickly printed alarming headlines that claimed that antioxidants were harmful, without stopping to analyze the study or ask experts in the field about the validity of the results. Yet a careful review of this meta-analysis reveals that it is full of flaws and draws an unwarranted, even misleading, conclusion that's not based on a full analysis of the facts.

Some of the major problems with the JAMA study

* The study is a meta-analysis, which involves combining the data from existing studies to create a single, large "pool" of data that is then used for statistical analysis. But a meta-analysis is only as good as the studies used to construct it. The stunningly obvious problem with the JAMA study is the exclusion of a massive amount of positive research. Out of 815 studies, 747 studies (a full 91 percent) were excluded, leaving only 68 studies for the statistical analysis. Some 400 studies were rejected because none of the participants in these studies died. But if you eliminate almost half of the studies specifically because there was no mortality, it is unfair to use the small number of the remaining studies to "prove" that antioxidants are deadly.

* The clinical trials used in the study were too diverse. They involved several different synthetic antioxidants, widely varying dosages, different durations of use and different types of volunteers. For

example, one of the studies looked at the effects of 200,000 IU vitamin A over the course of a single day-a huge dose used for a ridiculously short amount of time. Yet other studies used moderate doses of antioxidants over a period of years. In addition, many of the studies examined the effects of antioxidants such as lutein and zinc that were not even one of the five nutrients that the meta-analysis was focusing on. Using the data from this jumble of studies to create some sort of conclusion is like using 20 different brands of bricks to build a house which later falls down, then claiming the failure was entirely due to Brand X.

* Some of the studies included in the meta-analysis were treatment trials using synthetic antioxidants, designed to test whether taking an antioxidant might cure heart disease or another serious illness. Studies based on such a simplistic premise are bound to fail. Yet their results were included, giving the false impression of a strong correlation between antioxidants and risk of death. Professor Balz Frei, Director of the Linus Pauling Institute at Oregon State University, summed it up thusly: "All the new study really demonstrates is a bias toward identifying studies or research that show harm caused by antioxidants, and selective removal of research that shows benefits."

What the study didn't say about antioxidants

A large body of scientific evidence has found that taking antioxidant supplements can indeed reduce the risk of serious disease. One of the classic antioxidant studies, published in the New England Journal of Medicine in

see JAMA on page 39

JAMA from page 38

1993, tracked for eight years more than 87,000 female nurses, ages 34 to 59, all of whom were free of diagnosed cancer and heart disease at the beginning of the study. [2] During the course of the study there were 437 nonfatal heart attacks and 115 deaths due to coronary disease. Upon analyzing the nutrient consumption of the volunteers during the eight-year period, the researchers found that the risk of suffering a heart attack fell by about a one-third in those who consumed the highest amounts of vitamin E, compared to those who consumed the lowest. A companion study compared the amount of vitamin E consumption by 39,910 American male health professionals and found that those who took at least 100 IU per day for at least two years had about a 33 percent lower risk of developing coronary disease than those who did not take vitamin E supplements. [3] During the 14 years since the publication of these studies, many other researchers have found strong associations between consumption of antioxidants and a lower risk of heart disease, cancer and other diseases, as well as overall mortality. And just the presence of elevated levels of antioxidants in the blood appears to reduce the risk of suffering from serious ailments. For example:

* In a Japanese study involving 3,016 adults, high serum levels of antioxidant carotenoids (alpha-carotene, beta-carotene and lycopene) were “significantly associated with low hazard ratios for cardiovascular disease mortality.” [4]

* A 2005 study published in the *American Journal of Clinical Nutrition* compared the levels of alpha-carotene, beta-carotene and alpha-tocopherol in elderly Europeans. The results of this prospective study indicated “that high plasma concentrations of carotene are associated both with lower mortality from all causes and with cancer in the elderly.” [5]

* A case-control study, nestled within the European Prospective Investigation into Cancer and Nutrition (EPIC), found that “higher plasma concentration of some carotenoids, retinol and alpha-tocopherol are associated with a reduced risk” of developing gastric cancer. [6]

* In 2006, Australian researchers found

that selenium offered protection against cancer of the colon and rectum, and that dietary levels of vitamins E and C “were statistically significantly protective for both colon and rectal cancer at all levels of consumption, and for both vitamins there was a dose-response effect of increasing protection, particularly so for colon cancer.” [7]

This is just a small sampling of the large number of antioxidant studies with positive outcomes that have emanated from research centers around the world. Yet very few of these were included in JAMA’s anti-antioxidant meta-analysis, which “proved” antioxidants are harmful. Is it because the researchers decided in advance what the conclusion would be, then cherry-picked studies that would support their view? Our understanding of antioxidants is still evolving, and there are still gaps in our knowledge. Researchers are currently comparing the effects of natural and synthetic sources of antioxidants, of antioxidants in their different chemical forms, of single antioxidants versus combinations, and of varying doses. However, it is clear that both high levels of antioxidant consumption and high levels of antioxidants in the blood are associated with better health and increased longevity. [8]

References:

- [1] Bjelakovic G, Nikolova D, Gluud LL, et. al. Mortality in randomized trials of antioxidant supplements for primary and secondary prevention: systematic review and meta-analysis. *JAMA*. 2007;297(8):842-57.
- [2] Stampfer MJ, Hennekens CH, Manson JE, et. al. Vitamin E consumption and the risk of coronary disease in women. *NEJM*. 1993;328(20):1444-9.
- [3] Rimm EB, Stampfer MJ, Ascherio A, et. al. Vitamin E consumption and the risk of coronary heart disease in men. *NEJM*. 1993;328(20):1450-6.
- [4] Ito Y, Kurata M, Suzuki K, et. al. Cardiovascular disease mortality and serum carotenoid levels: a Japanese population-based follow-up study. *J Epidemiol*. 2006;16(4):154-60.
- [5] Buijsse B, Feskens EJ, Schlettwein-Gsell D, et. al. Plasma carotene and alpha-tocopherol in relation to 10-y all-cause and cause-specific mortality in European elderly: the Survey in Europe on Nutrition and the Elderly, a Concerned Action (SENECA). *Am J Clin Nutr*. 2005;82(4):879-86.
- [6] Jenab M, Riboli E, Ferrari P, et. al. Plasma and dietary carotenoid, retinol and tocopherol levels and the risk of gastric adenocarcinomas in the European prospective investigation into cancer and nutrition. *Br J Cancer*. 2006;95(3):406-15.
- [7] Kune G, Watson L. Colorectal cancer protective effects and the dietary micronutrients folate, methionine, vitamins B6, B12, C, E, selenium, and lycopene. *Nutr Cancer*. 2006;56(1):11-21.
- [8] The information in this article is not intended to provide personal medical advice, which should be obtained from a medical professional, and has not been approved by the U.S. FDA. “Vitamin Research News” is intended solely for individual, non-commercial use. Permission to reproduce all or part of the material or information is granted by Robert Watson CEO Vitamin Research Products, 4610 Arrowhead Drive Carson City, NV 89706 or by fax to Robert Watson at 775.884.1336.



Pearls of wisdom from Dr. Bill

As endurance athletes’ core temperatures are increased and body fluids are lost, the stomach tolerance for absorption of fuel-rich fluids are remarkably reduced.

The stomach tolerates fluids, fuel, and electrolytes at very low (isotonic) osmolality at around 280 to as high as 303 mOsm. A glucose-polymer (maltodextrin) solution at 280 mOsm presents @ 10-12% Hammer Nutrition fuel by weight. Such a solution of long-chain carbohydrates is immediately absorbed through gastric lining. What we observe is athletes who have problems with fuel intake do not realize that a simple sugar solution can easily reach 400-500 mOsm with too many calories to too little fluid. It does not take much simple sugar to stop absorption of fluid and much needed electrolytes as core body temps increase and circulating fluid volume is lost in evaporative sweat.

An example of such was in the early 1990’s, when Marshall Ullrich was testing Sustained Energy (SE) in the Badwater- Mt. Whitney 140-mile ultramarathon. He ran like a wild man on SE passing the midpoint way under the past record time. At the 75-mile mark, he popped a cinnamon jaw-breaker for taste and mouth feel. At mile 77, he was bent over double with stomach cramps! He walked mile 78, went back to his SE formula, and finished winning the race in record time. Even a “hint” of simple sugar can interrupt gastric absorption rate when osmolality restrictions are stressed.

We seldom have a day when an athlete reports complaint due to overloading osmolar pressure by consuming too much simple sugar or even too much Hammer Nutrition fuel in hopes of resolving an energy crisis late in an event.

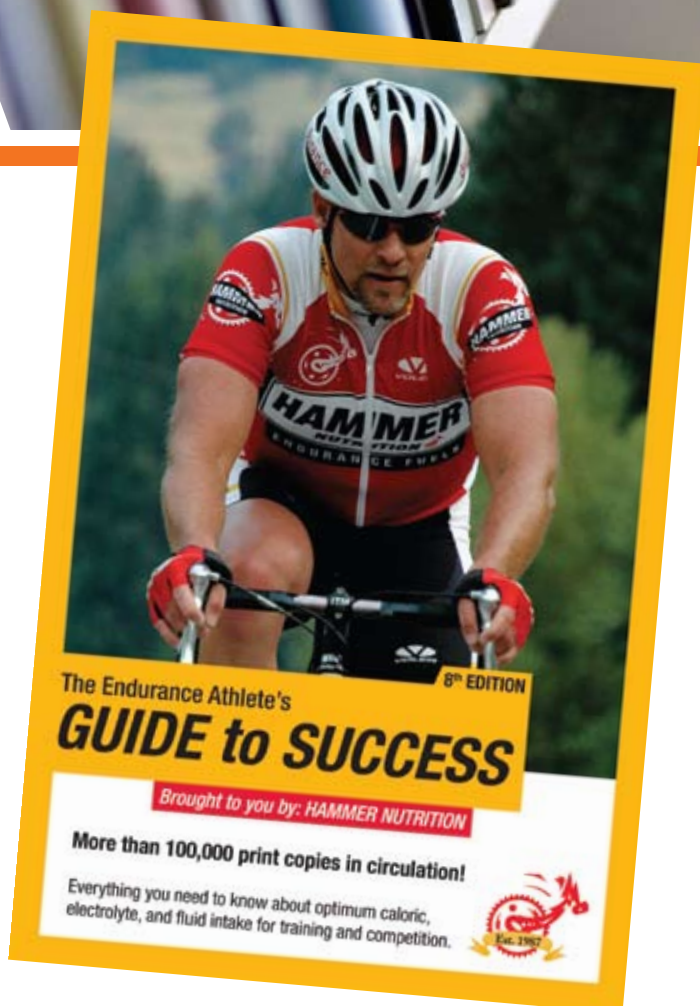
When gastrointestinal core heating increase and body electrolyte and fluid stores decrease, keeping fluid-fuel solutions isotonic favors long-chain glucose polymers.

Knowledge resources

Steve Born

Endurance Athlete's Guide To Success -

Believe it or not, the 8th edition of "The Guide" is just about complete (yes, it's true!) and we expect hard copies to be available at some point in February. The latest edition of this great information resource contains two new articles, with more useful information added to the articles that currently exist in "The Guide." In addition, we've included metric conversions wherever necessary, which makes this resource even more user-friendly worldwide. Needless to say, all this new information has created the biggest Guide to Success ever, with the 8th edition stretching out to approximately 140 pages. What hasn't changed, of course, is the basic information we want to provide to endurance athletes, primarily regarding how to properly fuel the body prior to, during, and after exercise. Since its humble beginning several years ago, thousands upon thousands of athletes have come to trust the information contained in The Endurance Athlete's Guide to Success to help them enjoy higher quality workouts and better race results. The 8th edition of this unique resource is the best ever and we're really excited about how it's coming together. The Endurance Athlete's Guide to Success will be available soon (we promise!) and we'll keep you updated as to its ETA. In the meantime, you can download a free copy of the current edition of The Guide from our web site at www.hammernutrition.com/guide



Hammer Nutrition Product Usage Manual - Vital info at your fingertips!

As you begin your 2008 season, but aren't yet sure which products to consider incorporating into your supplement or fueling program, our Product Usage Manual is the easy way to resolve that dilemma! Formerly two separate booklets-known as the "Little Red Book" (for all the Hammer Nutrition fuels) and the "Little Blue Book" (for all the supplements formerly under the E-CAPS banner)-the Hammer Nutrition Product Usage Manual contains lots of useful information combined into one handy resource. In there you'll find an easy-to-follow guide as to what products you should consider using and/or starting with, along with our recommendations for designing the ultimate supplement and fueling program. Product information and dosage suggestions for each product are included as well. You can download a free copy of the Hammer Nutrition Product Usage Manual from our web site (www.hammernutrition.com/downloads/PUM.pdf) or ask for a free hard copy with your next order.





*Giving the thumbs up at the 2007 Ironman World Championships.
Photo - Angela Nock*

Nate's Corner

Nate Llerandi



Too Much of a Good Thing is Bad

As athletes, we generally fall prey to the "more is better" credo. We make great gains in our fitness through intense

training, so why not do even more and propel ourselves into the realm of "super fit?" However, intense training has a ceiling, and it's not one we want to bash our heads into.

The human body can take only so much punishment before it starts to fall behind the recovery curve. We can sustain high-level training for a maximum of 8-12 weeks without a break, but then our body starts to severely break down and/or regress. We will begin to stagnate, get slower, get sick, injure ourselves, or lose our mental edge if we try to push ourselves continuously without reprieve. This phenomenon is not limited to those who train hard day in and day out; even athletes who have a balanced week of training among the various intensity levels need to take consistent breaks during the season.

After every 3-4 hard weeks, insert a recovery week. Cut back on hours by 40-50% and reduce your intensity. Most of a recovery week should be aerobic - below 75%. By allowing your body this down time to absorb all of the hard training you just completed, you are also allowing it to repair itself in ways it simply can't if you keep pounding away.

If you're honest with yourself and include regular rest weeks, you'll find yourself more excited to return to hard

training and better prepared to do so. Ultimately, you will improve your results in both training and racing.

Commitment

There are no varying levels of commitment, in my mind. You are either committed to a task 100% or you are not. If you are not, then why are you doing it in the first place? Does not matter if the "task" is training, racing, painting the house, working on your relationship with a significant other, or whatever. I'm painting the entire interior of our house. I don't enjoy painting, but I guarantee that when I'm finished it will look like a professional did it. I'm committed to doing a really good job of it, despite my dislike of the task.

We all like certain aspects of our training more than other aspects. Some aspects we may downright dislike (or hate). But, in a sound training program, all aspects are necessary in building the best program you can to help you succeed. Some of us like winter training better because it tends to be more relaxed - more aerobic focus and less focus on high-intensity intervals. Others like training in the summer because it is warmer or because they like the bigger focus on race-specific intensities.

The problem is that when we have less enthusiasm for a specific task, we run the risk of not putting 100% of ourselves into that task. "Oh, it's winter and my first big race is still 5 months away, so I can sleep in this morning and skip swimming. Swimming is my weakest sport and I know I should be working on it, but the pool is so cold in the morning and it's dark out and my car's heater doesn't even get hot until I'm already at the pool and missing one workout

won't adversely affect me." Starting to sound like an excuse yet? The truth is we can always find a way to justify lack of commitment. It's not hard. What is hard is staying true and committed to yourself, and your goals and aspirations. Another personal example- sorry, I use myself as an example because I know myself and what goes through my head, not from a "look at me" stance-is that I couldn't sleep last night. Some time after 1:00am I finally fell asleep but I kept waking up the rest of the night. I probably slept about 2-3 hours total. I could have skipped my swim workout, up at 5:15 and in the water by 5:50, but I didn't. I could have justified it by telling myself sleeping in until 6:45 would have allowed me to hit the business day better rested. And that may have been true. To me, it was a cop out. So I swam and had a great workout. And I plan to have a great run in a couple of hours as well.

Winter is no time to slack. If you don't put in the appropriate work and workload now, then your summer results will be less than you hope and expect. Likewise, putting in the work now does not necessarily mean you can breeze through the summer. While your workload and emphasis both change as you cycle through your training year, your commitment to that training plan should never waiver. If it does, you've either over-extended yourself physically and/or mentally, or you're not as excited about what you're doing as you lead yourself to believe, or you've set unrealistic goals for yourself.

Being wholly committed to a sound plan is just as important as setting up the sound plan in the first place. It is your action (your commitment) that transforms your good intentions into positive results.

From the Archives

Bill Misner, Ph.D.

QUESTION : In the past two months I've done three rides over 10 hours. Once I'm finished, eaten, cleaned up and gone to bed I sleep like crap. Each time I've sweat all night long. Anticipating this, last night I slept with the A/C turned way down, the ceiling fan on, and only a sheet covering me. It was of very little help; I still was hot the entire night.

When I mentioned this (a few weeks ago) to a friend of mine who does multi-day Adventure Races, she said, "Welcome to endurance racing/riding; it's called Fevering Out" She said that usually once you end up around 12 hours of pretty serious exertion, upon sleeping your body runs a very low grade fever. She couldn't explain it, but said all of her AR buddies experience it too.

Can you give some feedback/advice?

ANSWER : Fevering Out is a condition involving excess perspiration caused by stimulation of the sweat glands through the adrenergic nervous system. The scientific name for this condition is hyperhidrosis. Hyperhidrosis associated with prolonged exercise is a normal condition by which our skin regulates metabolism in the presence of other irregularities. Perspiration is one of

four primary vehicles (skin, urine, feces, breath) for removing toxins, free radical wastes, toxic metals, minerals, vitamins, 5% alcohol, and water. Hyperhidrosis is a natural response to help the body reduce accumulated toxic/non-toxic substances, and should not be inhibited.

During excess perspiration the body excretes high levels of magnesium, potassium, and sodium. This further suggests that excess magnesium, potassium, and sodium or a combination including deficiency in calcium may increase the intensity of the fevering out experience. Whether that is actually happening to an individual could only be determined by specific blood tests. Deficiencies of linoleic acid (omega-6) essential fatty acid may also exacerbate this condition. Sleep hyperhidrosis is also a secondary symptom of several conditions such as AIDS, brucellosis, hyperthyroidism, chronic lymphocytic leukemia, Epstein-Barr virus infection, pneumonia or other infections, lymphomas, sleep apnea, Hodgkin's disease, tuberculosis, glandular fever, female menopause, and use of the prescription drug Reboxetine.

Training tolerance/adaptation and adequate intake of fluids, fuels, and

electrolytes during prolonged exercise may mitigate your symptoms. I suggest hydrating up to 28 fl oz liquid, 240-280 calories, and 3-6 Endurolytes each hour during exercise. After prolonged exercise, be sure to force fluids and replace the average 8400-9000 calories spent in a 12-hour+ event. These calories should include 15-20% lean protein sources, 20-25% healthy fats, and 55-65% carbohydrates from raw plant and whole grain sources. Micronutrient intake should include 14 Premium Insurance Caps, 2-4 Carlson's Salmon Oil capsules-both products taken in divided doses-and 1 capsule iFlora for 3-5 days after the event, with 80-100 fluid ounces of liquid. Remember, hyperhidrosis or "fevering out" is a natural response to help the body remove accumulated toxic and non-toxic substances and fluids. It should never be inhibited.

References

Advanced Nutrition and Human Metabolism, Sara M Hunt & James L. Groff, West Publishing, St. Paul, Minnesota.
Exercise Physiology, McArdle WD, Katch FI, Katch VL, Williams & Wilkins, Baltimore, Md.



Bill Misner, Ph.D.

Director of
Research & Product
Development
Emeritus

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HOT TIPS

Eat fiber to prevent weight gain

To help prevent weight gain, especially during the off-season, keep dietary fiber intake above 30 grams daily while making sure consumption of high glycemic carbohydrates is limited to during or immediately following exercise.

From *Soni's Kitchen*

Sonia Frank

Hearty Tomato Soup

Ingredients:

1 1/2 tbsp. canola oil
1 cup chopped onions
1/2 cup finely chopped celery
1/2 cup finely chopped carrots
1 tsp. dried basil
1 tsp. dried dill
1 clove minced garlic
2 28 oz. can tomatoes, pureed in food processor or blender
4 cups chicken stock or broth from bouillon
1 tbsp sherry (optional)
pinch .of pepper

Preparation:

In a large soup pot, sautee onions in oil. When transparent add celery and carrots, sautee for 5 minutes. Add herbs and garlic, cook for a couple of minutes. Add remaining ingredients. Bring to a boil, then cook on low simmer for 35 minutes, stirring frequently. Add salt and pepper to taste.

Nutritional facts per serving:

Calories 86; Protein 2.6g; Carbohydrates 12.5g; Fat 3.1g

Pepper Ahi Steaks

Ingredients:

Fresh Ahi tuna steaks
Canola oil
Peppercorns
allow about 2 tablespoons per person (preferable use a gourmet blend)

Preparation:

Brush an Ahi steak lightly with canola oil on both sides. On a cutting board, coarsely crush the peppercorns with the bottom of a small pot or pan. Lay Ahi on pepper on both sides of steak. Grill, BBQ or pan fry without oil. Cook for about 6 minutes on each side, or until done. Serve with lemon or Tarter sauce.

Nutritional facts per serving: Calories 204; Protein 43.6g; Carbohydrates 0g; Fat 2g

Simple Brown Rice

Ingredients:

2 cups plus 1 tbsp. water
1 cup brown rice
1/2 tsp. salt or bouillon

Preparation:

Bring water to boil, add rice and salt, stir once. With lid off, wait for water to boil again. When it boils, put lid on and simmer for 45 min. or until water is gone. Set aside and let cool.

Nutritional facts per serving: Calories 216; Protein 5g; Carbohydrates 44.8g; Fat 1.8g

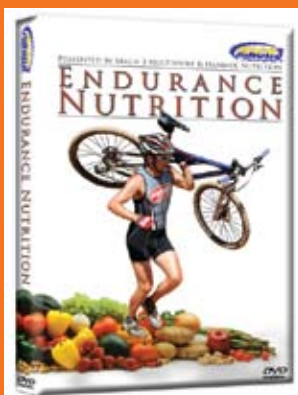
Orange Julius

Ingredients:

8 oz. water
4 oz. orange juice
3 scoops Sustained Energy

Preparation:

Put all ingredients into container with lid; shake well and voila!



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Supplementation

A necessity, not an option

Steve Born

I've been labeled a "supplement junkie" for longer than I care to remember, most likely because I've been taking supplements-and quite a few of them-for 20+ years. I often get teased about how many of them I take, with more than a few people over the years having asked questions such as, "Why do you take so many supplements? You're eventually going to die someday anyway, so isn't taking all those pills kind of a waste?" Honestly, if I had a nickel for every time I heard that question... but I digress. Seriously though, I am a big believer in the consistent use of an intelligently thought out supplement program and my response to my naysayers is usually something to this effect:

* Yes, as much as possible, I try to consume the best diet I can. However, like you and everyone else, I don't eat an ideal diet all the time, or at least as much as I should (such as when I travel).

* No matter how well I eat, no matter how high quality my diet may be, the nutrient density in the foods I consume won't meet my body's requirements, especially when I'm training and/or stressed from work/personal obligations.

* Along with diet, exercise, stress management, spirituality, and other components, I believe that supplementation contributes significantly to my overall well-being, so I can achieve the healthiest, most productive life possible.

* Sure, I'm going to die some day, but I want to postpone that day for as long as possible. Also, when I reach old age, I still want to be mentally and physically active. When I hit my 60's, 70's and beyond, I don't want to be incapacitated by sickness or disease; I still want to be

able to ride my bike, go skiing, and do other activities, and I definitely want my mental faculties intact as well. I don't want to just exist when I get older; I want to live!

These are the primary reasons why I've been an admitted supplement junkie for all these years. Sure, I've made some mistakes over the years in my supplement purchases (I've wasted a lot of money on supplements that over-promised and greatly under-delivered), but I remain a firm believer that, in addition to a high quality diet, the consistent use of the right supplements has and will continue to pay significant and noticeable benefits. As a result, I have absolutely no regrets and offer no apologies for the amount of supplements I've taken and will continue to take.

Now it's my turn to ask you a question: Do you think that your diet provides the optimum amount of all nutrients, and thus you take no supplements? If you answered, "Yes," then this is a "must read" article for you, one that I hope will convince you of the importance of a supplement program. One of the main reasons I recommend the consistent use of an intelligently designed supplement program is because, quite frankly, the "balanced diet will provide all you need" notion is a myth. You cannot obtain all of the nutrients your body requires from your diet, and here's why:

* 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.

* New studies show that food alone does not supply all the micronutrients

we need to prevent deficiency, let alone achieve optimal health.

* Very few of us have routine access to fresh, locally grown foods. Much of our diet comes from foods grown far away, picked when unripe, and then sent packing. Nutritional content is questionable and usually depleted.

* Even if we could obtain all the nutrients we need from our diet, it's highly unlikely that any of us eats an ideal diet as consistently as we think we do.

All this said, please understand that I'm not suggesting that you can neglect your diet, take scads of pills, and have all your nutrient needs covered. By no means is that the message I'm trying to get across. No supplement program can or should take priority over the consumption of a healthy diet-that's a no-brainer. Supplementation means just what the word means, supplementary. The pills we take do not substitute for a healthy diet; I cannot emphasize enough that your primary nutritional goal is to consistently consume a healthy diet.

What does this entail? It means eating whole grains and locally grown organic fruits and vegetables as much as possible, and avoiding packaged, processed foods and junk foods at all times. It means a low-sodium diet. It means consuming a variety of foods. It means avoiding foods containing artificial sweeteners, colors, flavors, and preservatives. It means you want to avoid added simple sugars (sucrose, fructose, glucose, etc.) in both your daily diet and in your sports fuels. It means many other things as well, but you get the picture. At Hammer Nutrition we

see SUPPLEMENTS on page 45

SUPPLEMENTS from page 44

emphasize both quality nutrition and supplementation. As Brian is fond of saying, “the quality of the calories you consume always matters.” That’s a message you need to take to heart!

Supplementation fills in where diets fall short, and fall short they will, especially given the high nutrient demands of endurance athletes. So where exactly does regular food consumption fall short?

- Usually not in calories, except during and right after endurance exercise.
- Never in salt!
- (Often in protein for hard-training athletes.
- Seldom in fat, though Omega 3s can be an issue for some.
- Almost always in micronutrients, and that’s the focus of this article.

As mentioned earlier, regular diets simply can’t cover the entire range of vitamins, minerals, phytochemicals, antioxidants, and other micronutrients necessary to maintain optimal health and peak athletic performance. If you want to achieve your best performances in your workouts and races-and, even more importantly, enjoy optimal health (not minimal, optimal!)-then daily supplementation is a necessity, not an option.

Even the best of diets is not enough. Eating whole foods is by far the best way to supply your body with the myriad plant-derived, health-benefiting phytochemicals, but today’s food supply can’t provide all of the basic vitamins and minerals. Our food simply won’t even meet the nutrient needs of average people, let alone athletes. Dr. Bill Misner wrote this many years ago, and it’s something I’ve never forgotten (and neither should you):

“Athletes today ingest only 11% of the organic nutrients from their food sources that the athletes of the 1940’s enjoyed.” Even more sobering is the ever-increasing body of research that suggests that many people’s diets are insufficient in supplying enough nutrients to prevent a deficiency disease.

Did you get that? Forget about providing enough nutrients to promote optimal health, many people do not eat enough quality food to meet the

minimal Reference Daily Intake (RDI) micronutrient requirements for preventing deficiency-related disorders. Misner’s hallmark paper, “Food May Not Provide Sufficient Micronutrients to Avoid Deficiency” (Townsend Letter for Doctors and Patients 261:49-52, April 2005, available at http://www.hammernutrition.com/downloads/diet_deficiencies.pdf) is but one effort to point out this startling problem.

And Dr. Misner is not the only one who suggests that diet alone does not provide adequate disease-preventative micronutrients at the current RDI-level. The research of the distinguished nutritional scientist Bruce Ames, professor of biochemistry and molecular biology at the University of California, Berkeley, also presents a hypothesis that implies micronutrient deficiency may eventually deteriorate the quality of whole human cell health. A portion of Professor Ames’ abstract reads as follows:

Inadequate dietary intakes of vitamins and minerals are widespread, most likely due to excessive consumption of energy-rich, micronutrient-poor, refined food. Inadequate intakes may result in chronic metabolic disruption, including mitochondrial decay. Deficiencies in many micronutrients cause DNA damage, such as chromosome breaks, in cultured human cells or in vivo. Some of these deficiencies also cause mitochondrial decay with oxidant leakage and cellular aging and are associated with late onset diseases such as cancer.

Reference: Ames BN, Low micronutrient intake may accelerate the degenerative diseases of aging through allocation of scarce micronutrients by triage, *Proc Natl Acad Sci USA*, 2006; 103 (47): 17589-94. (Address: Nutrition and Metabolism Center, Children’s Hospital of Oakland Research Institute, Oakland, CA 94609, USA). http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Retrieve&dopt=AbstractPlus&list_uids=17101959&query_



The Daily Essentials!

hl=1&itool=pubmed_docsum

The bottom line is that our diets, no matter how good we think they may be, may not provide enough of the micronutrients needed to prevent a deficiency. That’s why taking supplements, especially a multivitamin/mineral supplement, is a wise strategy to employ; it helps bridge the gap

between what you should be receiving and what you’re actually getting from your diet. Consuming the best possible diet as consistently as possible, and augmenting that with a multivitamin/mineral supplement plus additional antioxidants and auxiliary/complementary nutrients is the best way to cover your nutritional bases.

The Recommended Daily Intake: Recommended for what?

The Reference Daily Intake standard (formerly known as the Recommended Daily Allowance, or RDA) doesn’t take into account the higher needs of endurance athletes. Dr. Misner states, “Researchers have established... that athletes tend to deplete vitamins, minerals, enzymes, coenzymes, and other substrates more than sedentary people do.” It’s not just more calories that endurance athletes need; it’s the whole nutritional bag.

Moreover, conventional standards are tuned to deficiency avoidance rather than optimal health, so it’s questionable whether anyone should rely on them. In *The Real Vitamin & Mineral Book*: Using supplements for optimum health, 4th ed. (New York: Avery Publishing Group, 2007), Shari Lieberman, Ph.D., and Nancy Bruning devote a chapter to outlining the benefits of using a higher-dose vitamin/mineral supplementation regimen. I think the title of this particular chapter, “The RDIs - The Minimum Wages of Nutrition,” pretty much says it all. No one spells it out better than Lieberman and Bruning in their book, one that I highly recommend:

see SUPPLEMENTS on page 46

SUPPLEMENTS from page 45

Just like the RDAs, the RDIs have three basic problems: (1) you cannot get all of the nutrients you need from today's food; (2) the RDIs reflect amounts that are adequate to prevent nutrient-deficiency diseases, and are not tailored for individual needs; and (3) the RDIs do not address or consider optimum health or the prevention of degenerative diseases such as cancer and heart disease."

In another chapter, "The Optimum Daily Intakes (ODIs)," they write:

In order to attain a state of optimum health and disease prevention, we must take into our bodies optimum- not minimum- amounts of vitamins and minerals. To distinguish them from the lesser amounts characteristic of the RDIs, I have called these amounts the Optimum Daily Intakes, or ODIs. The need for ODIs is based on six factors:

- 1) The RDIs are generally based on an amount that simply prevents overt deficiency diseases.
- 2) The RDIs do not take into account preventative or therapeutic levels of nutrients.
- 3) We cannot meet the RDIs even if we eat the "perfect" diet.
- 4) Because of many factors, including the loss of nutrients through shipping, storage, and processing, the foods available to us do not contain the amounts of vitamins and minerals they should contain.
- 5) Owing to the constant bombardment of stress factors, from pollution to emotional stress, we require higher levels of vitamins and minerals than originally thought.
- 6) We do not absorb 100% of the vitamins and minerals in foods and supplements.



Are you convinced yet that you need to supplement? Remember, Dr. Lieberman has regular human welfare in mind, and not the even higher demands of endurance athletes.

**Supplements are dangerous?
Antioxidants shorten life span? Be
careful what you read!**

Every once in a while you'll come across a media article lambasting, or at least questioning, the use of supplements. It's usually not bad science, but misapplied research in the hands of story-seeking media. Studies that apply only to very limited conditions, or that have only mildly suggestive findings don't stop circulation-hungry editors from printing these results with sensational headlines that make sweeping generalizations. Sometimes the studies themselves seem to be questionable, and this makes what the public finally reads even more suspect.

Perhaps you remember the vitamin E "studies" from not so long ago, the ones that suggested that high doses of vitamin E were not only unsafe, but they also contributed to potentially shortened life span. As it turns out, this wasn't new research at all, but rather a meta-analysis, a mathematical study that combines data from different trials in an attempt to draw statistically valid conclusions from the larger, combined set of data. Bottom line was that the findings of the meta-analysis were inappropriately applied to the general population.

Not too long after that, another attack on supplements hit the front pages. Australia's Sydney Morning Herald announced "Vitamins Raise Death Risk." Now if that's not enough to get you at least a little concerned about taking vitamins, you're not easily frightened! Now, the studies weren't necessarily

targeting vitamins per se, but antioxidants in general. Well, guess why the subjects in these studies died: over two-thirds of the people involved in them were already sick with heart disease, cancer, or other ailments. Taking antioxidants didn't prevent these already very sick people from dying! Of course, that really shouldn't come as a surprise because they (antioxidants) are intended to help prevent disease, not cure already existing conditions. Research has already established that antioxidants don't work in disease treatment. Taking vitamin E (or whatever) didn't prevent a person already afflicted with cancer from dying of cancer.

Now, when the playing field isn't anywhere near being level-in this case meaning that when over two-thirds of the people involved in the studies were already very sick-how can you not have negative results? This is really an inappropriate application of limited research. Call it sensationalism or flawed science or both, but the fact remains that we already have an enormous amount of research (including one listed just following this paragraph) that has shown the overwhelming benefits of antioxidant supplementation for reducing free radicals and improving health. The sensible use of antioxidant supplements yields numerous and overwhelmingly positive results.

Note: For another view on this particular topic, please see the article "JAMA ANTIOXIDANT STUDY: An In-Depth Examination of a Flawed Report" elsewhere in this issue.

A recent study: Just one of countless numbers!

While "scare tactic studies," as I like to refer to them, often make the headlines, seldom are positive study results promoted. As an example, the safety and efficacy of beta-carotene has come into question quite a bit as of late (see the article: "The rationale for beta-carotene dosing" in the last issue of EN). However, because it's a study/article that shows positive benefits (and yes, I'm being cynical here), I'm betting you haven't heard of the latest beta-carotene study. Check this out:

see SUPPLEMENTS on page 47

SUPPLEMENTS from page 46

Beta-carotene supplementation associated reduced cognitive decline. The November 12, 2007 issue of the AMA journal *Archives of Internal Medicine* reported on a study that found that taking beta-carotene supplements for 15 years or more might confer a protective effect against cognitive decline in older men.

The research involved 5,956 men over the age of 65 who participated in the Physicians' Health Study II, a randomized trial of beta-carotene and other nutritional supplements for the prevention of chronic disease. The Physician's Health Study II is a continuation of the Physicians' Health Study, which tested the effect of 50 milligrams beta-carotene every other day and low dose aspirin on male participants. For the current study, Francine Grodstein, ScD, of Brigham and Women's Hospital and Harvard Medical School and her associates administered cognitive function tests to 4,052 men who participated in the original study since 1982, and 1,904 newer recruits enrolled between 1998 and 2001.

The team found that those who received beta-carotene for an average of 18 years had significantly higher scores on several tests of cognitive function compared with those who received a placebo. Among men who had received short-term treatment with beta-carotene there was no improvement observed.

"The results support the hypothesis that long-term supplementation may be necessary to achieve cognitive benefits," the authors remark. They note that the Nurses' Health Study found that a decade or more of vitamin E supplementation was associated with improved cognition, while failing to find the same result with shorter-term use. Similarly, the Honolulu-Asia Aging Study found improvements in cognitive impairment associated with vitamin C and E supplementation only after 10 years. In animals, brain aging starts early in adult life, and long-term nutrient exposure may be required for neuroprotection.

"In this generally healthy population, the extent of protection conferred by

long-term treatment appeared modest; nonetheless, studies have established that very modest differences in cognition, especially verbal memory, predict substantial differences in eventual risk of dementia; thus, the public health impact of long-term beta carotene use could be large," the authors write in their commentary. They conclude that, "the public health value of beta carotene supplementation merits careful evaluation. Moreover, as these data support the possibility of successful interventions at early stages of brain aging in well-functioning subjects, investigations of additional agents that might also provide such neuroprotection should be initiated."

Source: http://www.lef.org/newsletter/2007/2007_11_13.htm

A comprehensive supplement program-A necessity, not an option!

It should be clear by now that to optimize athletic performance and overall health, you need to consistently consume the best possible diet and augment that diet with a high quality comprehensive supplement regimen. Of course, you need to tailor your supplement program to the specifics of your particular training, health, and personal factors. A 64 year-old male Nordic skier has different requirements than a 22 year-old female triathlete. That's where the Hammer Nutrition supplements come in. As with our fuels, we have designed our supplement line for maximum flexibility and integration. Whatever your personal needs require, we have products available to keep your body in the best possible condition.

If you're not currently on a supplement program, or if you are but want to expand it to provide even greater benefits, give us a call and one of our client support advisors will be happy to help. Also, check out our recently updated Product Usage Manual (<http://www.hammernutrition.com/downloads/Manual.pdf>). In there you'll find an easy-to-follow guide as to what products you should start with and our recommendations for designing the ultimate supplement program. Product information and dosage suggestions for each product are included as well.

HOT TIPS**Maintaining optimal hydration status**

No research has conclusively arrived at an recommended daily intake for fluids, but about 0.5 - 0.6 fluid ounces per pound of body weight makes a more accurate standard than the "eight glasses a day" commonly recommended for everyone. Multiplying your body weight in pounds by .5 to .6 will give you the figure, in fluid ounces, that you should aim for daily to maintain regular daily hydration needs (that is, in addition to your exercise-induced needs).

The HOTTEST TIP**Elevating hGH while you sleep revisited**

In previous issues of *Endurance News* we discussed the benefits of taking whey protein prior to bed to help elevate hGH levels by as much as 400% (*read the original Hot Tip below*). The key for this to be successful is to take Hammer Whey in water only, as carbohydrates will hinder the process. Note that Hammer Whey contains no added carbohydrates and no flavors or sweeteners so it's going to be somewhat bland tasting. However, the benefits derived are anything but bland!

From Endurance News 54

Elevating Human Growth Hormone (hGH) levels is the surest way to enhance athletic performance and shorten recovery time. This is why some athletes resort to risky injections. To safely raise hGH levels without risk to your endocrine system, try this - just before bed, take 1 scoop of Hammer Whey protein in 4-6 ounces of water, not juice or milk as those carbs will hinder the process. This practice may safely raise hGH levels while you sleep by as much as 400% compared to the usual nightly spike. That's enough to have a noticeable effect on anabolic, muscle building/maintaining activity in the body, and that's a good thing.

Hammer Champions!

Steve Born



Suzy Degazon competes in her 10th Ultraman!
Photo : Timothy Carlson

2007 US National 50-Mile Championships

The Lundblads Lead the Way!

You may remember the names Mark Lundblad and Anne Riddle Lundblad, as they were our featured “spotlight” athletes in Endurance News #56 (May 2006). Well, they continue to rock the ultramarathon running world and the latest accomplishment of this husband and wife duo is one-of-a-kind.

On Sept 22, 2007 they took first place in their respective division at the Tussey mOUNtainBACK 50-Mile Ultramarathon, which served

as the 2007 US National 50-Mile Championships. The event, contested on state forest roads through Pennsylvania’s Rothrock State Forest, contains over 5,000 feet of elevation gain. Needless to say, it’s plenty tough!

Mark’s winning time was 6 hours, 3 minutes, and Anne’s winning time of 6 hours, 36 minutes, 16 seconds not only established a new course record, it was the 5th fastest time overall.

Congratulations to both Mark and Anne-2007 US National 50-Mile Champions!

Complete race results at www.tusseymountainback.com/results.html



Photo : Studio 2 Photography by Chuck Wong

2007 Ultraman World Championships

For many triathletes, the season’s goal is the Ironman World Championship held each October in Hawai’i, on the Big Island. For ultra distance triathletes, the Big Island is also the destination for a lesser known, but even more grueling race: the Ultraman World Championships, which takes place Friday, November 23 through Sunday, November 25. The distance of each discipline-swim, bike, run-is hard enough, and splitting them up over three days, at least in the eyes of this writer, doesn’t make it much easier, if any. The race schedule is: Friday, 6.2-mile swim & 90-mile bike; Saturday, 171.4-mile bike; Sunday, 52.4-mile run.

Hammer Nutrition athlete Shanna Armstrong accomplished an incredible “three-peat” by capturing the women’s title for the third straight year, finishing 8th overall, out of 32 solo competitors with a total time of 26 hours, 43 minutes,

24 seconds. Finishing in the 4th spot in the women’s division, and 19th overall, was long-time Hammer athlete Suzy Degazon, in a time of 29:46:49. What’s remarkable about Suzy’s effort was that this was her 10th straight Ultraman finish... she’s the only woman to achieve such a monumental accomplishment.

In the men’s division, Scott Gower came in an impressive 6th overall, with a time of 25:20:17. Gower and his wife, Debbie, own Go For It Sports, a Hammer Nutrition retailer in Atascadero, CA. Last year’s men’s champion, Jeff Landauer, finished 10th overall this year, in a time of 27:04:16.

Congratulations to these Hammer athletes and all the athletes who completed this epic race! Full results can be found at www.ultramanlive.com



Shanna Armstrong in the Hawaii sun
Photo : Timothy Carlson

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HP	Hammer Gel Single Serving	\$1.25	
9SAM	Hammer Gel Pouch Sampler	\$9.95	
HB	Hammer Gel 12 Pouch Box	\$13.95	
HF	Hammer Gel Flasks	\$1.50	
	<i>Flavors : Apple-Cinnamon (A), Banana (B), Chocolate (C), Espresso (E), Orange (O), Unflavored (P), Raspberry (R), Tropical (T), Vanilla (V)</i>		
FB	Hammer Bar	\$2.49	
	Hammer Bar 12 Count Box	\$29.88	
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H1	HEED - Single	\$1.49	
H32	HEED - 32 Serving	\$19.95	
H80	HEED - 80 Serving	\$44.95	
	<i>Flavors : Lemon-Lime, Mandarin, Unflavored</i>		
EL	Endurolytes	\$18.95	3 @ \$16.95
ELP	Endurolytes Powder	\$18.95	3 @ \$16.95
SE1	Sustained Energy - Single	\$2.69	
SE8	Sustained Energy - 8 Serving	\$17.95	
SE30	Sustained Energy - 30 Serving	\$52.95	4 @ \$47.95
P1	Perpetuem - Single	\$2.49	
P16	Perpetuem - 16 Serving	\$22.95	
P32	Perpetuem - 32 Serving	\$42.95	
	<i>Flavors : Orange-Vanilla, Unflavored</i>		
RR1	Recoverite - Single Serving	\$2.49	
RR32	Recoverite - 32 Serving	\$49.95	
RRS	Recoverite Shaker	\$4.95	
WHEY1	Hammer Whey - Single	\$2.25	
WHEY	Hammer Whey - 24 Serving	\$29.95	4 @ \$26.95
SOY	Hammer Soy - 24 Serving	\$24.95	4 @ \$21.95

Endurance Supplements

AF	Anti-Fatigue	\$17.95	3 @ \$14.95
AS	Appestat	\$29.95	
BO	Boron	\$14.95	
CH	Chromemate	\$9.95	
DC	Digest Caps	\$12.95	
ATP	Energy Surge (ATP100)	\$19.95	2 @ \$17.95
LE	Liquid Endurance	\$22.95	3 @ \$19.95
MC	Mito Caps	\$24.95	
PM	Phytomax	\$24.95	3 @ \$22.95
PIC1	Premium Insurance Caps	\$31.95	
PICL	Premium Insurance Caps - 210	\$29.95	
PICS	Premium Insurance Caps - 120	\$17.95	
PSA	PSA Caps	\$24.95	3 @ \$22.95
RCS	Race Caps Supreme	\$49.95	3 @ \$47.95
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REM	REM Caps	\$19.95	3 @ \$17.95
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TR	Tissue Rejuvenator	\$24.95	
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XBL	Xobaline 90	\$29.95	
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IF	i-Flora	\$24.95	

Kits

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\$69.95 *You save \$13.05*

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*All Globus pads are single lead.

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VW	Wind Vest	\$44.95	s-xl
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WRR	Womens Running Shorts w/pocket	\$29.95	Red s-l

Patagonia

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CPSW	Womens Capilene 1 T-Shirt	\$36.00	White s-xl

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CWB	Winter Beanie	\$17.95	Black os
HH	Halo Headband	\$12.95	Blk/Wht/Blue os
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HHA	Halo Anti-Freeze	\$16.95	Black os
CAB	Baseball Caps NEW	\$14.95	Black os
CKB	Knit Beanie NEW	\$8.95	Black os
CVW	Headsweats Visor NEW	\$11.95	White os

Casual Wear

TRS	Short Sleeve	\$11.95	Red s-2xl
TRY	Youth Short Sleeve	\$11.95	Red xs-m
TRL	Long Sleeve	\$14.95	Red s-2xl
TA	Est 1987 NEW	\$12.95	Asphalt s-2xl
SSB	Hooded Sweatshirt NEW	\$29.95	Black s-2xl
TRW	Womens Short Sleeve NEW	\$11.95	Red s-xl
TBLW	Womens Long Sleeve NEW	\$12.95	Brown s-xl
SSBW	Womens Hooded Sweatshirt NEW	\$24.95	Black s-xl

Accessories

HF	Hammer Gel Flask	\$1.50	
DBC	Double Clip Flask Holder	\$7.50	
GBC	Bike Mount Flask Holder	\$12.95	
HWBL	Large Water Bottle	\$2.50	24oz.
HWBS	Small Water Bottle	\$2.50	21oz.
HWBP	Pink Water Bottle	\$2.50	24oz.
RRS	Recoverite Shaker	\$4.95	25oz.
GB	Gel-Bot Fuel System	\$15.95	24oz.
GBSF	Gel-Bot Soft Flask	\$10.95	5.5oz.
GBL	Gel-Bot Lid	\$11.95	
QC	Quick Coin	\$0.75	
TAT	Tattoo	\$0.25	
PAT	Patch NEW	\$0.50	
SPH	Hammer Sticker Pack	\$0.50	
BBANW	Hammer Gel Banner	\$20.00	
HC	HEED Cooler	\$29.95	
PG	Hammer Pint Glass	\$4.50	16oz.
NWB	Hammer Nalgene Bottle NEW	\$6.95	Smoke 32oz.
BPR	Hammer Sack	\$9.95	Red
TOW	Hammer Towel	\$4.95	White

53x11 Coffee

CBR	The Big Ring	\$11.95	12oz.
CEB	The Early Break	\$11.95	12oz.
CCB	The Chain Breaker	\$11.95	12oz.
CTW	Training Wheels NEW	\$11.95	12oz.
CM	Coffee Mug NEW	\$9.95	Black/Red 15oz.

Bookstore

BFH	Guide To Success Handbook	\$4.95	
BTN	Treat Your Own Neck	\$9.95	
BTB	Treat Your Own Back	\$10.95	
BSB	Sugar Blues	\$6.99	
BFM	Food Is Your Best Medicine	\$6.99	
BWT	Water : The Shocking Truth	\$8.95	
BHB	Healing Back Pain	\$13.99	
DVEN	Endurance Nutrition DVD NEW	\$29.95	
DVRC	Runner-CORE DVD NEW	\$69.95	
DVCC	Cyclo-CORE DVD NEW	\$99.95	

Body Care

BALMF	Hammer Balm	\$4.95	1/4oz.
BALM	Hammer Balm	\$19.95	1oz.
CFF	Cool Feet NEW	\$1.50	3g.
CF	Cool Feet NEW	\$11.95	2.7oz.

2007 Furnace Creek 508

Hammer athletes dominate again!

Steve Born

The 24th edition of this epic Hammer Nutrition sponsored race, which began on October 6th, was the largest ever, with 192 cyclists entered: 78 solo racers and 114 racers comprising the 41 relay teams of various configurations. This California race begins in the Los Angeles County city of Santa Clarita, heads north and enters Death Valley from the west, rolls through the valley, passes the lowest point in the U.S.A (Badwater, -282'), exits the valley via the vicious Jubilee and Salsberry Passes, and finally finishes at Twenty-Nine Palms in the Mojave Desert. Called "the toughest 48 hours in sport," this ultimate test of grit and training covers 508 miles and ascends 10 mountain passes, totaling 35,000 feet of elevation gain. Additionally, the race is contested mostly on desert roads, which means less-than-ideal pavement (from the race website: "... in fact, all the road is terrible after you pass Badwater") and usually in typical desert climactic (read: very hot) conditions. This combination of distance, terrain, and road/weather conditions makes for a uniquely difficult challenge. Although the heat usually plays a key role in determining the outcome of the race, conditions at this year's 508 were significantly cooler than in other years, adding a new factor: nighttime temperatures dropping to near freezing!

Rising above all of the race challenges, and all other competitors in the solo division, were avid Hammer Nutrition users Michael Emde and Karen Armstrong, both from Spokane. The 37-year-old Emde, featured in the "Athlete Spotlight" article in this edition of EN, led all the way, successfully defended his men's solo title, and became the first solo male back-to-back champion in the history of the race. His time of 27:32:30, second fastest solo time in history, established a new 30+ age group record and missed Kenny Souza's 2005 course record by a mere 17 minutes.

The 47-year-old Armstrong was one of seven women competing in the 508 for the first time. She and another Hammer Nutrition-fueled athlete, 508 veteran Nicole Honda (who was a member of the record-breaking two-woman team in RAAM earlier in the year), engaged in an epic battle. At the mid-point of the race in Furnace Creek (mile 252), Honda had a 13-minute lead. However, by time station #4 in Shoshone (327 miles), Armstrong had passed Honda and established a 16-minute gap. Armstrong continued to increase her lead and won her first Furnace Creek 508 in a time of 36:58:24. Honda maintained her position and finished in second place in a time of 39:52:59.

Top Hammer Nutrition-fueled finishers in this year's Furnace Creek 508:

MEN'S SOLO

- * Michael Emde-1st place-27:32:30
- * Joel Sothorn-3rd place-31:21:18
- * David Haase-4th place-31:49:48
- * Andrew Zelhof-6th place-32:37:53
- * Hugh Gapay-9th place-34:02:36

WOMEN'S SOLO

- * Karen Armstrong-1st place-36:58:24
- * Nicole Honda-2nd place-39:52:59
- * Mavis Irvin-4th place-41:26:22

Congratulations to these and all the solo and team finishers! In addition, a special congratulations to longtime Hammer Nutrition client Sam Beal, who was one of three cyclists inducted in the Furnace Creek Hall of Fame in 2007.

For complete results, time splits, webcast, and over 2,100 images, maps, stories, and much more, visit www.the508.com. The 2008 edition, celebrating the 25th Anniversary of the race, will be held October 4-6, 2008. Applications to compete will be accepted April 1-15, 2008 only, with the race field announced on April 25, 2008. Hammer Nutrition looks forward to another epic Furnace Creek 508!

Fuel right, feel great!

Great results are likely when you fuel with Hammer Nutrition. Just ask Michael Emde...he holds the Men's Solo Champion title for 2006 and 2007 at the Furnace Creek 508. Start fueling right and feeling great today with Hammer Nutrition fuels!

Order today!

1.800.336.1977 / www.hammernutrition.com

"I won the Furnace Creek 508 for the second year in a row and I couldn't have done it without the Hammer Nutrition products and great support from you."

- Michael Emde, 2007 Men's Solo Champion, 27:32:30



Photo: Chris Kostman



Barb Watson at the
2007 Ironman World
Championships

Hammer Athletes

24 Hours of Moab

We were extremely elated the weather was so great this year. After last year's flash flooding and hypothermia inducing temperatures, we felt so lucky to have warm air (but not too hot) and precipitation free skies. In 2006 we were there supporting our significant others, but decided to put our own team together, and so our Women's Vet team was formed - Crankers without Wankers. Turns out some fellow (male) racers thought our team name was a bad match.com personal ad. Our husbands were not too psyched about that!

Starting in late summer, the four of us trained and trained, met for coffee to strategize, and we were feeling very confident. In the weeks preceeding the race we were hit with ailments galore: Jami tore her achilles tendon, Karen started having recurring asthma like symptoms, and Cathy had a nasty upper respiratory infection. Given all of this,

we felt very thankful we were all healthy enough to compete when October 12th came around.

The race was AMAZING and very tough. Even though we didn't have the weather to deal with, the dusty and sandy conditions put another challenging twist to the course, which is technical enough as it is. There were spots where the sand was so deep, when your front tire hit it, it would literally stop you in your tracks! Talk about keeping you on your toes, especially at night and with any speed.

Riding at night in Moab is spectacular, almost made you forget it was a race, so peaceful in the desert. The 24 Hour race course is a great mix of classic technical Moab slickrock, fast two track road, a bit of singletrack, and a lot of sand. It really is a blast, so challenging and diverse. We had some very tough competition-the Women's Vet class is very fast! It made

the race even more exciting having some strong women to chase. We were very happy with our podium 3rd place finish.

As mentioned, because of the sand, the course this year was very taxing. We were all drinking HEED and Perpetuem, and using the Anti-Fatigue Caps as needed. These products were lifesavers! Although we felt tired at times, all of us managed to avoid the dreaded bonk, and by listening to other teams talk, the bonk was very prevalent this year. In fact, my last lap was when I felt physically the strongest-unfortunately a flat tire slowed me a bit that lap.

Thank you so much to Hammer, we had such a great time, and are looking forward to next year!

Hilary, Cathy, Karen, Jami



Joe Lyle

I have been a casual user of Hammer Nutrition products for a year or so. And as such I have obviously not had any spectacular results.

Early this year I decided to take your program seriously. I read the Endurance guide and followed all of the recommendations and suggestions.

Immediately my performance was enhanced and my endurance events set new Personal Records. I consistently felt significantly better during the events and after the events. My training was enhanced and my recovery was superb. I was totally and absolutely amazed and happy with all of the results!

Recently I completed a solo and unsupported bike ride across Alaska, 500 miles on the Trans Alaska Pipeline Haul Road, officially the Dalton Highway. Having driven the road a couple of times I knew that it would be remote, difficult and require good nutrition to endure the challenge.

In the planning for it I factored in the use of Hammer Nutrition products. This included multiple daily doses of Perpetuem, Recoverite, Gel and Endurolytes. I spent about \$200.00 for all of this from a store in Anchorage that was nice enough to order it and have it on hand for me.

The ride ended up taking me 17 days to complete 500 miles with a 65 pound bike (bike and gear). My slowest average speed for a day was 5.6 MPH and my highest average speed for a day was 8.3 MPH. My max downhill speed was 12

MPH. The lowest daily mileage was 16.7 miles. Several days I posted 40 miles in a day. This gives you some idea of how difficult the ride was with the mountains and road surface.



During one of my product orders with you someone was kind enough to send me a Hammer Nutrition towel. As some measure of my appreciation to you I included the towel in some of the pictures that I took.



Obviously I will continue to use the Hammer Nutrition products. I have and will continue to encourage my friends to use them. They are now a total part of my training and events.

THANKS-A-MILLION for your superb product and the courtesy and friendliness of everyone I talk to when I order!

Sincerely,

Joe Lyle

Kelly McGregor

I wanted to express my thanks to Hammer Nutrition for helping me with my athletic goals.

In April 2007, I signed up for the „Ride with the Eagles% at Northeast Texas Community College, in Mount Pleasant, Texas. I was originally signed up for the 20 mile ride, but early in the ride I stopped to help a bicyclist whose chain fell off. She and I talked as we rode along. She talked me into doing the 40 mile and I did. I did the ride in 4 hours and 30 minutes. I decided to order Hammer Nutrition endurance supplements after that ride, because of cramps and lack of energy.

In June 2007, I competed in “RBT Sprint Triathlon” in Allen, Texas. I used the Hammer supplements for my triathlon in June. I loaded up on Liquid Endurance and Race Day Boost a few days before, took Anti-Fatigue Caps an hour before the race and 2 Endurolytes 10 minutes before race. My training was 2 hours and 30 minutes, but finished the race in 1 hour and 40 minutes.

In July 2007, I signed up for the 100K Bike Rally „tour de Paris%, in Paris, Texas. I challenged myself as I knew I had Hammer Supplements. Again, I took the Anti-Fatigue Caps, and Endurolytes before the race. During the race, I took 2 Endurolytes and 1 Anti-Fatigue Caps each hour. I had no cramps, and I was passing up men on the ride that had a calf radius about the size of my waist. I finished the 58.1 miles in 4 hours and 11 minutes. I was actually passing up men on this ride the last 8 miles, which was up hill. I was completely sold on Hammer Products after that!

Thanks Hammer!

Kelly McGregor

***Become a
world-famous
athlete!***

Okay, so maybe ‘world-famous’ is a bit of a stretch but we do want to include YOU in our 2008 catalog, other printed materials or on our website. Round up those awesome action shots of you doing what you do and send them to anock@hammernutrition.com. Please put PHOTO SUBMISSION in the subject line and include the name of the race and any photographer information in the body of the message, copyright-free photos are preferable. You just may find yourself representing Hammer in the printed world so start practicing that signature...you're gonna need it for all the autographs!



Participants at the 2007 Highline Hammer

Hammer Athletes

Two new Hammer Nutrition sponsored races

We're sure to add more and more races to our ever-growing list of sponsored events but we're especially excited about two that are "on board" now: The Miami International Triathlon (March 16th) and The Battle at Midway Triathlon (June 14th).

From the Miami International Triathlon web site (www.mitriathlon.com) -

"Beautiful views with a unique race course, professional level of organization, and a good portion of entertainment are just a few of the characteristics M.I.T. - Miami International Triathlon can provide. As the season starter, M.I.T. will take place in the cool & sunny spring of Miami. With a favorable weather, all you have to do is to relish your race while your family enjoys the event 'village' - a place full of entertainment, food and refreshments that will leave no one bored.

From the Battle at Midway Triathlon web site (www.bamtriathlon.com) -

"Whether you are racing for a part of the \$20,000 Professional prize purse, the \$2,000 Elite Prize Purse or just competing to get that finisher's award, you are sure to have your best and most memorable race experience ever!!! All of the weekend's races are complete with some of the most spectacular courses and run venues in the sport!

So what are you waiting for, register early as registration will close once the races fill! Whether it's the triathlon or the off-road duathlon, they are sure to become the next 'MUST DO' races in the US! Are you READY TO BATTLE?"

Hammer Nutrition is honored to be the official nutrition sponsor of these two great triathlons!

Joan Fujita and Team

From September 29th to October 6th, 2007, I participated in the California Coast Classic/ Arthritis Foundation Bike Ride from San Francisco to Los Angeles (Santa Monica). It was an eight day ride that covered 525 miles. Although I am rather new to cycling, I trained for the past six months using both Perpetuem and HEED, that was introduced to me by my riding buddy Rosalie Kneebone. As the training rides got tougher with more hills and longer rides, greater than 80 miles, I really felt the positive effects of your products.

For this 8 day ride, we all used Perpetuem faithfully and had a very successful ride with no complaints of cramping or bonking. We rode as much as 90 miles on some days and up and down the hilly coast of Big Sur that were extremely challenging. Thank you for the great product and I just wanted to share this photo with you. Pictured is Cheryl Chua, Joan Fujita, Rosalie Kneebone, and Victor San Lucas in Cayucos, California. We had many compliments on the "kits" we wore and promoted the products throughout the ride.

Sincerely,
Joan Fujita



Your performance foundation

**Available in
three sizes!**

30-packets - \$31.95
210 capsule - \$29.95
120 capsule - \$17.95



Order today!

1.800.336.1977
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Kevin Stroud

I've been a recreational runner for quite a while, ending each of the last dozen years with either a half or full marathon. But after "getting serious" and qualifying for (and running!) the Boston Marathon last spring, I decided I needed a new challenge and began to step up to ultra-marathon distances with the goal of running a 100-miler.

What I didn't realize, at first, was the level of training for an ultra is significantly higher than for "just" a marathon! My training included multiple 40 mile training runs (one completely at night) and instead of a single 20 mile training run on the weekend, I would do TWO of them (or longer) back-to-back on Saturday and Sunday to "run on dead legs".

Obviously, my nutrition needs would be very important so that this level of training would be beneficial and not just "beat me down" - and I used Hammer

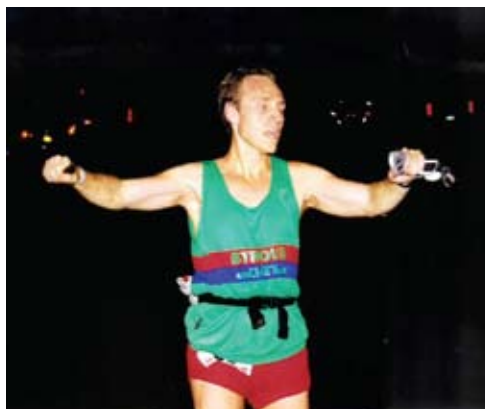
products extensively. Nutrition on-the-run was Hammer Gel (raspberry's my favorite!), which I bought in bulk along with flasks, and all my long runs were immediately capped off with Recoverite so I would be refueled for the next training run.

The end result was I finished 14th out of 140 starters in the Arkansas

Traveller 100-miler, and I'll take a "top 10% finish" in any race on any day as validation I put forth a good effort - especially in my debut race at the 100 mile distance.

Oh yeah, my ancestors came to America from Stroud, England almost 350 years ago and I'm the sole Yankee member of the Stroud & District Athletic Club - so I often race in "club kit".

Here's a picture of me finishing the Arkansas Traveller 100-miler a little after 5am, in a time of 23:11.



Amanda McIntosh

Attached is a photo from my recent win at the Q50 Patagonia wearing my Hammer Pink. It was great!!!! I finished 1st female and 6th overall in a time of 7:41. The race was simply amazing!! 9 countries were represented!

Thanks for everything,
Amanda



Photo - Marcos Ferro, www.marcosferro.com

Jay Burke

I recently donned (and specified you guys as my main sponsor) my Hammer Kit during the Utah Cyclocross Series in which I raced the Men's 35 plus (masters) A group. I ended up 11th overall in the 10 race series, and had a few top 10 finishes.



Eric Troili

Hang Glider Flight 4/20/07
Mount Stewart, Bellingham, WA
Pilot: Eric "Thrasher" Troili
2007 Furnace Creek 508 Finisher 45:21:31
Hammer is not just for Ultra-Cycling!



Athletes...do you want the Hammer Nutrition community to know what you're up to? Have a great, copyright free photo you want to share? Send a short email to anock@hammernutrition.com (please put Race Report in the subject line) about your recent accomplishments and we'll try to include it in our Race Report.

ENDURANCE NEWS



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- **Hammer Camp**
A summary from a skeptic
- **Globus e-Stim Units**
A new partnership
- **Casein**
Is it a quality protein choice?
- **Product Spotlight**
Race Caps Supreme
- **Athlete Spotlight**
Michael Emde
- **Primal Quest**
Coming to Hammer's home state in 2008
- **Off-Season Exercise**
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