



HAMMER
NUTRITION®

ENDURANCE NEWS

May 2007 : Issue 054

The endurance athlete's comprehensive knowledge resource since 1992

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ABOVE : Pro cyclist Ron Jenson, of Team Waste Management, hammers during the ASU crit.
Photo - Will Samsky

Replacement vs. Replenishment

Bill Misner Ph.D., Steve Born

To fuel successfully, less is better than more!

From the beginning we've recommended that our clients shun the recommendations of "experts" and their "replace what you lose" fueling advise because it almost always guarantees failure or at the very least, sub par performances punctuated by upset stomach, cramps or worse.

Now, if this bad fueling advice were on its way out, we probably wouldn't have to continue to wave our flag on this matter. Fact is, despite so much evidence against them, a number of magazines, athletes, coaches, and organizations still promote this flawed theory of fueling.

We encourage you to use the information in this article as your fueling guide and we guarantee you will have higher quality workouts, better race results and feel better too!

Perhaps the biggest challenge we at Hammer Nutrition face is convincing athletes that the "replace what you lose" theory of endurance fueling is completely ineffective and needs to be eliminated if better results are to be achieved. What we're talking about are the "experts" and organizations that are still recommending that athletes need to consume what they lose during exercise in equal to near-equal

(see REPLENISHMENT on page 26)

Complex Carbohydrates

Bill Misner Ph.D., Steve Born

A superior fuel compared to simple sugars

Most everyone who is familiar with Hammer Nutrition fuels knows our uncompromising stance on the use of complex carbohydrates versus simple sugars for optimal fuel/energy production. In Endurance News #52 we ran an article ("Complex Carbs or Multiple Carb Sources - Which is Better?") that discussed the results of research by the Dutch sport scientist, Asker Jeukendrup. To recap the article, the general conclusion of the studies showed that a blend of carbohydrates increased oxidation rates, which means higher amounts of energy were produced. In one of Jeukendrup's studies he found that cyclists who ingested a 2:1 mixture of maltodextrin and fructose were able to oxidize up to 1.5 grams of carbohydrate every minute. In another study - using a mixture of

glucose, fructose, and sucrose - oxidation rates peaked at 1.7 grams per minute. Both those results are pretty eye opening, considering that the majority of research on the subject has shown that complex carbohydrates allowed for 4.0 - 4.1 calories/minute, or approximately 1 gram/minute.

However, there's more to the results than what first meets the eye, and the key to our original article - our position regarding the studies as well as the companies that are jumping on the "multiple carb sources are better than complex carbs alone" bandwagon - was not to dispute the results of Jeukendrup's published studies. The key to the article was whether or not

(see COMPLEX CARBS on page 30)



From the office of Brian Frank



Welcome to Endurance News #54

As I almost always do, I need to start by thanking you for your support, without which we would not be cele-

brating our 20th anniversary with unabated growth. You are the reason for our success and I can promise you that no matter how big we grow, we'll never forget how we got there or why you chose to support us in the first place. We know you want healthy, effective products, at a fair price, backed up by friendly, helpful staff and all of the resources necessary to make the most of the products and all of your hard work. That may sound like a pretty tall order, but it's one I've been happily filling for 20 years now. I'm counting on you to continue to hold us accountable to this standard and to be vocal if we ever fall short.

Perhaps I'm a perfectionist, or a little compulsive, or both, but I've found that when you dedicate 20 years of hard work towards a singular goal, you can't help but end up with something to show for that hard work. That's what I tell my son and anyone who asks how we've achieved the modest success that we are enjoying today.

Speaking of success, you may have noticed Hammer products proliferating in retail outlets in your town or area. It's true that our retail sales channel is growing even faster than our direct-to-consumer channel. I can already hear the thoughts of many of you who may be concerned that our growth into the mainstream markets will lead to "dumbed down" products and the evaporation of our personalized service.

Trust me, that will not be the case. Again, I expect you to hold me to this commitment.

In fact, I want to reassure you that this growth will benefit you as well as us. The reason for this growth is due to our grass roots marketing program and the influence that you have on your local athletic community. This growth enables us to sponsor and support more of the exact type of events you compete in and, in many instances, even have our products on course as well. The convenience of being able to "buy local" or just pick up last minute products at your local bike shop, running, or tri shop, or even your local health food store, is another perk for you.

So, do remember that Hammer Nutrition is partly your company and we are counting on you to help guide us as we grow into a full-fledged multi-channel company with your feedback and constructive criticism. That's why I monitor and personally reply to suggestions@hammernutrition.com.

This issue of Endurance News is chock-full of the good stuff. In fact, we added twelve more pages just to fit it all in. The feature articles are necessary reading as they provide a counter balance to the anti-supplement hype and bankrupt "replace what you lose" fueling philosophy that continues to be promoted in the mainstream and sports media. I know for many of you we are simply preaching to the choir, but we must doggedly continue to profess the safety and efficacy of nutritional supplements and the wisdom of our "replace what you can assimilate" fueling philosophy, rather than having even one of you be led astray. If this information is already a given to you, we encourage you to pass it along to your less informed family

and friends. You can also write a letter to your local newspaper and or sport specific publication.

In addition to Steve's articles, our usual contributors have some good reading in store for you. Beginning in this issue, we have a new contributor, coach Al Lyman, sharing his thoughts on how to get your race season off to a good start. You will also find an expanded "Race Report" which is my favorite part of the newsletter because it highlights you, our reader and most treasured asset. So, if you've ever read this section and thought, "Hey, I should send them some photos and a story about my recent race or epic journey," you're right, you should!

Enjoy the read, eat right, train smart, make recovery a priority and Hammer on race day! Oh yeah, and tell your family how much you love them, every day.

HOT TIPS

Elevate HGH while you sleep - Why before bed

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 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.



What I Love Most About Spring

Tony Schiller

"It's spring fever. That is what the name of it is. And when you've got it, you want - oh, you don't quite know what it is you do want, but it just fairly makes your heart ache, you want it so!"
~Mark Twain

I love changing the clocks so we can start riding late into the evening.

I love watching lake ice turn black and then suddenly disappear.

I love seeing the sky start to awaken while driving to the pool at 5:45 AM.

I love a hot Jacuzzi after coming in from a cold, soaking rain.

I love conning myself into believing I'm in better shape than I really am.

I love getting sucked by ego and testosterone into a totally insane workout.

I love the first time I can charge up a hill and not go into oxygen debt.

I love cursing the cold, stiff headwinds that I hate so much.

I love turning around and convincing

myself that 30 mph wasn't wind aided.

I love changing the first flat tire of the year.

I love seeing street cleaners and pothole repairmen back in action.

I love hearing which young studs are super fit and pretending not to be worried.

I love putting myself on the hook by making public a big, hairy, audacious goal.

I love convincing myself that I'm ahead of last year even if I'm not.

I love believing I'll ride faster once my new Kuota K Factor arrives.

I love when race applications start to arrive in the mail.

I love shedding layers to expose blindly pale skin and hairy legs.

I love getting scolded - once again - by my wife for forgetting sunscreen.

I love warm muscles getting flexible

and winter soreness fading away.

I love overheating for the first time and wishing I'd brought Endurolytes.

I love my times the first day in the pool after shaving down.

I love shivering in sweats for 20 minutes after the first lake swim of the year.

I love when the UPS lady delivers all my racing supplies from Hammer.

I love pretending I'm happy to see an old rival at the first race of the year.

I love still - after all these years - feeling those competitive juices flowing.

I love starting the season undefeated.

Spring is nature's way of saying, "Let's party!" ~Robin Williams

April 2007 marks the start of Tony Schiller's 35th year in competitive racing and his 20th as a Hammer athlete. Tony's goal this year is to rebound to his old form for a 6th age group national title and to set-up a big year in 2008 when he turns 50. Beyond racing, Tony is a corporate motivator and the race director of the MiracleKids Triathlon. Contact: ts@tonyschiller.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 of Endurance News are available online 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.

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



Steve Born



Welcome to the spring edition of Endurance News!

For those of us in Montana (and I'm sure this feeling's similar for everyone who lives in a cold,

Northern climate), it's great to say goodbye to winter. I do love the snow and all of the winter activities, and I contend that, minute for minute, there's nothing better for building strength, endurance, and "top end" fitness than Nordic skiing. For all that, though, being cold for months gets wearying, and the scenery on the basement trainer is a tad stale come March. When the first opportunity comes to get back on the bike (even if it's still freezing cold outside), I embrace it. After many weeks of inhospitable, "I'm definitely not going outside" weather, there's nothing better than getting reacquainted with the bike and going out for a ride on a brisk, sunny day... the perfect way to say "See ya!" to winter.

This issue of EN marks the beginning of my eighth year here at Hammer Nutrition, and that, for whatever reason, has caused me to reflect on the past year or so. ("Uh oh, Born's getting reflective here"). Seriously though, 2006 was a momentous year for me, so the whole "getting reacquainted with the bike" thing that I mentioned a moment ago has even greater meaning for me this time around. In late 2005 I married my long-time Australian girlfriend, Cassandra (after going through months of seemingly endless paperwork and interviews with the INS... but that's another story). She'd been to Montana several times before, but this time it

was "for keeps," so it was a major change for her, adapting to life here, where people eat bison and put kangaroos in zoos.

About a year ago we took another major step, the dreaded/loved "first home purchase." Yeah, I'm a little behind the caboose, but I am finally growing up. As all of you homeowners know, it was a pretty hectic ordeal from the seemingly interminable searching for the right house up until we signed the papers. Then the real ordeal began <grin> as we moved in, and then spent almost all available time away from work on the endless project (it really doesn't end, does it?) of transforming someone else's home into one that was uniquely ours.

As a result of all these wonderful, life-changing events, absolutely none of which I regret for a moment, both Cassandra, a two-time RAAM champion, and I have let our fitness slide. It's not easy to admit it, but right about now I am probably the least fit I've been in a long time... and oh, can I feel it! My first ride in 2007, which I did down in Phoenix when I was attending the ICTN (International Christian Triathlon Network) camp, was my first in way-too-long. It let me know just how very wide the fitness gap had grown. On this first ride of the year, while I wasn't crawling or anything like that, I did not even remotely resemble an ultra racer. Being "Furnace Creek Fit" seemed very far off.

As I write this, it's mid-morning Sunday. Cassandra and I will head out on our bikes soon, but yesterday's short, yet difficult (for me) two-hour ride left me with that "I've found muscles I didn't remember having" ache in my legs. However, these aches aren't

telling me, "Man, are you pathetically out of shape or what?" They actually feel really good, because they optimistically let me know that these huffing and puffing early season rides signal a new beginning for me. Sure, it'd be fairly easy to lapse into a state of self-pity (a/k/a laziness), where I could justify my lack of training through excuses such as, "I'm working lots of hours and don't have as much time as I used to," "I've got responsibilities both at work and home that I can't neglect," "I've been a competitive athlete for 'X' number of years; I don't need to bust my butt any more," or my all-time favorite, "I'm just too damn tired."

And yet they're really just excuses, not valid reasons for failing to balance all of the basic areas of life, which includes physical exercise as well as our home, work, family, and spiritual realms. My competitive RAAM days are most likely behind me and I don't have any other major competitions on the 2007 calendar, but I'm about as excited about training as I've ever been. Why? Because I know that even though it's not terribly comfortable at this time (read: I'm sore and tired after a ride!), by making the time to exercise regularly, I will be achieving a better balance in my life, which will undoubtedly help me to take care of my main priorities even better. Plus, I know that the few extra pounds I've gained will come off and my aerobic capacity and overall fitness will return, allowing me to ride farther, climb lengthy hills without wheezing, and actually feeling good after a ride. And when that happens, it's going to feel REAL good.

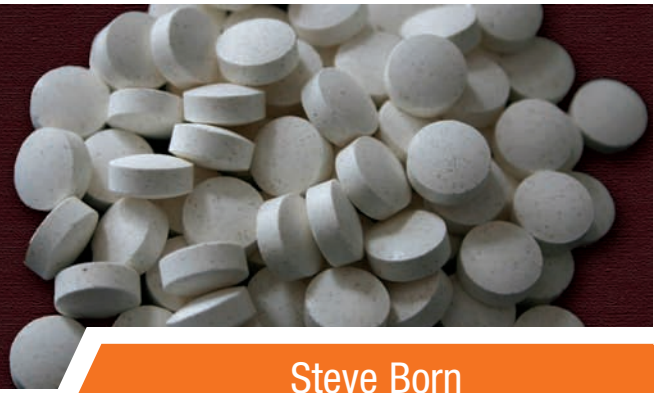
Having written all this, I'm not sure if there's a "deep message" I wanted to impart to all of you. Perhaps it's just to

(see STEVE on page 5)



Common Pain Relievers

New study indicates -
“Use with extreme caution”



Steve Born

Most all of us have, at one time or another, taken some sort of pain reliever (analgesic), and I think many of us would agree that when used sparingly and only when necessary, they have a rightful place in our medicine cabinets. Unfortunately, many athletes grossly overuse these medications, sometimes by “pre-loading” prior to an event in the hopes of staving off inflammation and joint pain.

However, as with any medication, analgesics have potential side effects. Ibuprofen and naproxen are readily available, over-the-counter (OTC) analgesics known as NSAIDs, which stands for Non-Steroidal Anti-Inflammatory Drug. Exercise-specific side effects of NSAIDs include nausea, diarrhea, constipation, dizziness, headache, and fluid retention. NSAIDs reduce blood-clotting activity, which can increase the severity of any bruise injury incurred during training. Many an athlete has suffered from these unpleasant effects (or even worse ones) by nonchalantly consuming large and/or too-frequent doses of NSAIDs.

A new study from Boston’s Brigham

& Women’s Hospital adds another potential side-effect issue. The researchers found that men who used NSAIDs six or seven times a week showed a 38% increased risk of developing hypertension. The study included about 16,000 male health professionals who had no history of hypertension. Men who used acetaminophen were next, showing an increased hypertension rate of 34% when used six to seven times a week. Even aspirin, which is often prescribed for its blood-thinning effects to those at risk for heart attack, showed an increased risk of high blood pressure development. Men who used aspirin six to seven times a week exhibited a 26% increased risk of developing hypertension.

Most of us who exercise regularly will probably have overall better health and fewer risk factors (obesity, smoking, high-fat diet, high sugar intake, etc.) than the general population. Nonetheless, hypertension, known as “the silent killer,” is definitely a condition to be avoided. However, competitive athletes in search of the “now” fix often don’t take long-term health problems seriously. As a group,

I’d guess that competitive athletes are a population at high risk to overuse NSAIDs. They have frequent aches and pains from training, and they don’t want to take any time off or even slow down their training programs. Instead, they just pour down the NSAIDs and keep up the pace.

The judicious use of such medications is certainly warranted at times, but there are some very real consequences to their use and overuse, including a most undesirable effect of increased risk of high blood pressure. An effective pain-relieving alternative to these OTC medications is Tissue Rejuvenator, which has a plethora of natural anti-inflammatory nutrients in its formula. In fact, many ultra distance athletes use TR regularly during their training and racing instead of the more commonly used OTC analgesics. They have reported to us that they’ve had substantially less incidence of unwanted side effects. So before you reach for that bottle of “Vitamin I,” take this new study to heart and consider using the all-natural Tissue Rejuvenator instead.

(STEVE from page 4)

encourage you. Today is a new day, it’s an opportunity for you to embrace the fact that you can and should begin again. Whether you’re coming back from an injury or a prolonged layoff due to any life situation, yes, it’s going to take time to get back to the level of fitness that you once enjoyed. However, as my father often told me, you can view these circumstances either as stumbling blocks that will knock you down or stepping-stones that will help you climb to bigger and better things. Those first few steps are

never easy (I was just thinking that as I gasped up a steep hill yesterday), but they can be some of the most enjoyable steps you can take... it’s all in how you choose to view it.

To me, and many others, spring has historically been a time that defines what the term “new beginnings” is about. As such, I think it’s a perfect opportunity to get reacquainted with the joy of training. Even though I’m no longer competing, I’m as psyched as ever about training more consistently and

effectively. If you’re at all in the same boat that I am, I hope that as this season begins and the year unfolds, you will be psyched about training or exercising regularly as well. Those initial steps might hurt a lot and tell you how out of shape you are, but they can be the very best ones because you’re making a pact with yourself to make your stumbling blocks stepping stones. As your fitness level increases, you’ll look back on the commitment you made with yourself and you’ll know, without reservation, that you did the right thing.

Soy Protein

Friend or foe?

Bill Misner, Ph.D.



Note: The debate regarding soy protein, one that has been going on for years, continues to rage. Some tout soy as being a super healthy protein source while others decry it as being responsible for a variety of undesirable effects. We asked Dr. Bill to provide his insights on this topic and we believe this will help take the confusion out of the debate, showing that soy is, in fact, a healthy source of protein.

This is my (Dr. Bill Misner) personal opinion on Soy Protein's anabolic property interpreted from the evidence presented in the literature. By disclosure, there are pros and cons debated by several of my colleagues, some of whom, I agree, and others, disagree.

Plant Phytoestrogens Effect

Phytoestrogens from plant lignans or isoflavonoids from at least 15 plants behave within the body like weak estrogens. Phytoestrogens are so chemically similar to estrogen that they bind to the estrogen receptors on the cells within the body. It should be emphasized that they do not initiate the same biological effects that true estrogens exert.

Phytoestrogens paradoxically act as anti-estrogens, effectively diluting the impact of the body's own production of estrogen, because they occupy the same receptor sites (estradiol receptor sites) that would otherwise be occupied by endogenous estrogen. Therefore plant phytoestrogens protect the body from the detrimental effects of excessive estrogen. The healthy foods and supplements that introduce phytoestrogens into the diet are Mexican wild yam, black cohosh, red clover, licorice sage, unicorn root, soy, flax seeds and

even tiny sesame seeds. None of these foods are associated with behavioral change or hormonal modification.

Plant Phyto-Anabolic Effect

Some foods and supplements are associated with increased anabolic pro-hormone effects. They are oats, American ginseng, ashwagandha, damiana, ginkgo biloba, gotu kola, horny goat weed, Korean ginseng, maca, marapuama, passion flower, tribulus terrestris, tongkat ali, savory velvet beans, yohimbe, and they may influence male or female sexual desire. The operant word is "may" since not all males or females will experience positive "effects" associated with dose. The basis for these effects is debatable and highly individual.

Harmful Excess Estrogen Effects

Elevation in natural estrogens may inhibit the body's production of parathyroid, deplete PABA, biotin, folic acid, choline, inositol levels and increase the body's requirement for vitamin E & vitamin B6. Soy is not associated with generating potent harmful estrogen effects.

ALCOHOL & AGE increase estrogen, potentially raising the levels of the most potent forms of estrogen in males. Excess potent forms of estrogen are associated with cancer. Of the three types of estrogens, estradiol is 1,000 times more potent in terms of its ability to stimulate breast tissue growth compared to estrinol. Estrinol, an endogenous estrogen is much, much more potent than the weak form with limited amounts found in soy, (from Genistein & Daidzein). It should be

emphasized that weak estrogens from plants block the more potent harmful estrogens remarkably reducing their effects. Estradiol potentially stimulates cell growth in certain tissues. Estrogens stimulate specific cell growth trophoblasts which are strongly implicated in cancer when they are produced in situations other than pregnancy. The more cells divide, the greater the risk that a genetic mishap will occur that could lead to the uncontrolled proliferation of cells characterized by cancer, especially breast cancer (specifically 2-hydroxyestrone form of estrone).

ALCOHOL (ethanol) increases estrogen levels by impairing the liver's ability to convert estradiol and estrone to estrinol. This lowers the testosterone:estrogen ratio in both men and women. What natural prohormone gains that occur after a hard workout are dramatically reduced with a post-workout beer or other alcoholic drink.

AGING - Estrogens (primarily estradiol and estrone) levels in males generally increase in tandem with the progression of the aging process. Consequently, phytoestrogens may protect the body from the toxic effects of excessive estrogens. The polyphenols in soy, (Genistein & Daidzein) compete with age-induced excess estrogen for occupancy of estrogen receptors, hence the excess effect in all masters age athletes is dramatically reduced by occasionally consuming soy.

Specific HARMFUL elevated estrogens consequence may occur by gender:

MALES having elevated estrogens (Estradiol + Estrone) may suffer from

(see SOY on page 7)



(SOY from page 6)

enlarged prostate, depression (due to them blocking the serotonin manufacturing properties of vitamin B6), male-pattern baldness, and systemic lupus erythematosus (SLE).

FEMALES having elevated estrogens (Estradiol + Estrone) may suffer from uterine fibroids, anxiety, and endometriosis. A high estrogens:progesterone ratio can be associated with multiple sclerosis, PMS-A (anxiety), and depression (due to them blocking the serotonin manufacturing properties of vitamin B6). Excess female estrogens may inhibit the mobilization of adipose tissue from cellulite for redistribution to other areas of the body (possibly accounting for the greater incidence of cellulite in females than in males). Elevated female estrogens are associated with insulin resistance in postmenopausal women using estrogens as part of hormone replacement therapy, ovary cancer, kidney cancer, and systemic lupus erythematosus (SLE).

Conclusion

Consuming GMO-free Soy generates anabolic sequences desirable for the health-conscious male and female endurance athlete, especially the 40- and over athletes. If an allergenic, thyroid, or digestion issue presents, then another protein should be selected. Soy's phyto-estrogen properties block the effects of potent endogenous estrogens with no known gender effects to males or females as reported from the literature. The net result from Soy Protein consumption is anabolic lean muscle mass gain. While I regard Soy as an excellent dietary protein, alternating Soy with other lean dietary proteins during training presents a responsible and defensible rationale.

References available upon request

HOT TIPS

Calendula ointment for scrapes and lacerations

Great for road rash and cuts, promotes faster healing, less scarring and infections. Find it in any health food store. Works as good or better than it's petroleum based counterparts.



Steve Born

If you've received our latest catalog or have visited our web site recently, you know that for 2007 we now have women's specific cycling gear available in a color scheme that you, our female clients, had requested. Well, while that initial order of the pink clothing was by no means conservative in terms of how many pieces we ordered, it quickly proved to be insufficient...we sold out of it within a mere couple of weeks! Needless to say, this oh-so-sharp looking clothing has been a hit with the female athletes; the feedback we've received - both in terms of design and fit - has been nothing less than spectacular.

We're happy to announce that our stock of this clothing has improved and though we may still be low on a couple of sizes here and there, we'll continue to work hard to ensure that we have ample supplies of all sizes available. Additionally, we are seriously considering adding triathlon-specific clothing in this popular color combination so we'll keep you posted on that.

Currently, we offer the following pieces in the new pink design:

Short sleeve jersey - \$34.95
Cycling shorts - \$39.95
Wind jacket - \$59.95
Arm Warmers - \$29.95
Cycling Gloves - \$19.95
Cycling socks - \$4.95

(All the technical information about each piece and sizing charts can be found on our website or in the catalog.)

In addition to the clothing, we also offer a matching water bottle (\$2.50 each). This 24 oz. Specialized wide-mouth water bottle is clear with a pink cap and the Hammer Nutrition

"chevron" logo emblazoned in pink.

As it is with all the Hammer soft goods, our prices are well below what you'd pay for clothing of this quality elsewhere. In fact, if you buy a complete kit (jersey, shorts, arm warmers, and wind jacket) you'll receive a 10% discount off the individual prices! Additionally, gloves, socks, and other Voler items purchased at the same time will be discounted as well.

We know it sounds clichéd, but we really are selling these items faster than our manufacturers can make them, so don't wait to get your hands on this supremely fashionable and functional clothing!



Antioxidant Supplementation

It will shorten your life!

Steve Born



Well, that's true... if you believe the headline of a recent article in the Sydney Morning Herald that ominously proclaimed, "Vitamins Raise Death Risk: Study". But it's not just the popular media. If you take stock in the latest supplement-bashing propaganda, read on for details about a paper published in the *Journal of the American Medical Association (JAMA)* in February.

Every once in awhile, and it seems to be occurring on an uncomfortably increasing basis, you'll come across a headline in a newspaper that lambastes the use of supplements. We needn't discuss the reasons for the media's propensity to publicize inconclusive or misleading studies. Needless to say, it happens. 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 contributed to potentially shortened life span. Well, like those "studies," this current one regarding antioxidants is rife with numerous flaws.

First though, let's take the word "study" out of the picture and replace it with the more appropriate term "meta-analysis," which is what the vitamin E "studies" and this new antioxidant "study" really are. One nutritional scientist wrote, "A meta-analysis is not a new clinical study. It is rather a mathematical study that 'pools' or combines data from different trials in an attempt to draw statistically valid conclusions from the larger, combined set of data. In general, mathematicians believe that the larger the sample size of data (number of people studied), the more valid are the statistical conclusions drawn from such data."

One problem with statistical conclusions drawn from meta-analyses is that the data can be manipulated to produce whatever results you're looking for. In the case of the vitamin E meta-analysis, one of the glaring problems was that if any of the people involved in any of the studies used in the meta-analysis died of unrelated causes (such as a car crash), they too were included in the "death due to vitamin E" category. Think about that. Even if the person died from causes not at all related to vitamin E, as part of the meta-analysis they were lumped in the category of "death due to vitamin E." How can that fairly represent anything about vitamin E toxicity?

Another problem with meta-analyses is that the results derived are only as good as the studies used. In regards to the antioxidant meta-analysis, perhaps the most flagrant flaw is that the analysts used only 68 of 815 available studies. In other words, they ignored over 90% of the available studies, but still arrived at the startlingly frightening conclusion that antioxidants decrease life span. Interestingly (and most likely not coincidentally), nearly half of the 800+ studies were rejected because none of the subjects died. Therefore, if almost half of the studies aren't even factored in to making a conclusion from a pool of statistics, especially studies that showed no mortality due to antioxidant supplementation, this seems to me like bending the rules so far as to arrive at meaningless conclusions.

It gets even more ridiculous.

On the second page of the Sydney Morning Herald article you'll find written, "Balz Frei, director of the Linus

Pauling Institute at Oregon State University, said the study and the data studied were both flawed because more than two-thirds of the previous research that was examined involved people with heart disease, cancer or other risks who were being treated to see if the supplements worked. 'This kind of approach does not work,' he said. "Over the years it has become clear from these clinical trials that antioxidants don't work in disease treatment."

Look carefully at what he writes: over two-thirds of the people involved in these studies were already sick with heart disease, cancer, or other ailments... and guess what? Paraphrasing Frei, taking antioxidants didn't prevent them from dying, which really shouldn't come as a surprise as they (antioxidants) are not intended for treatment purposes but rather preventative purposes. Taking some vitamin E (or whatever) didn't cure a person dying from cancer. Antioxidant supplementation intends to prevent disease states that accrue from free-radical effects. It won't cure the diseases any more than spraying Rust-Oleum(r) on already rusted metal will restore the metal. To say that antioxidant supplementation potentially decreases life span, if one is not looking at it from a preventative perspective but rather a curative one, is grossly misleading. And to begin with, 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 negative results NOT occur?

There are several other flaws in the JAMA meta-analysis that contributed

(see ANTIOXIDANTS on page 9)



Soy Scores Again!

More benefits attributed to soy protein's isoflavones

Soybean varieties
Photo - Wikipedia

Bill Misner, Ph.D.

As mentioned in another article in this issue of Endurance News, there's been an ongoing and passionate debate on soy protein. Some claim that it's beneficial for health; on the other hand, it may be related to some health problems. In the article "Soy Protein - Friend or Foe," Dr. Bill discussed the benefits of soy protein, providing a compelling argument for it being a healthy protein source. To augment that article, here is a very recent study that shows additional potential benefits of soy protein.

The study: Cancer chemopreventives associated with dietary EGCG, Epigallocatechin, Catechins, Tea, Curcumin, Turmeric, Curcuma Longa, Curry, SOY ISOFLAVONES,

Phytochemicals, Polyphenols.

Researchers¹ reviewed data from pilot studies and trials investigating the effects of polyphenolic phytochemicals such as epigallocatechin (EGCG) from tea, curcumin from turmeric, and soy isoflavones for the prevention of cancer. Studies that involved both healthy subjects as well as subjects with premalignant conditions or cancer were reviewed. Sufficient data exists to support further research into tea polyphenols - specifically, phase III clinical intervention trails examining its effects on the progression of prostate epithelial neoplasia, leukoplakia, and premalignant cervical disease. Further research into the effects of curcumin and soy isoflavones

on premalignancies would be appropriate to optimize the nature and design of suitable phase III trials.

The authors concluded that: "The abundance of flavonoids and related polyphenols in the plant kingdom makes it possible that several hitherto uncharacterized agents with chemopreventive efficacy are still to be identified, which may constitute attractive alternatives to currently used chemopreventive drugs."

Reference

(1) Dietary polyphenolic phytochemicals - Promising cancer chemopreventive agents in humans? A review of their clinical properties, Thomasset SC, Berry DP, et al, International Journal of Cancer, 2007; 120(3): 451-458.

(ANTIOXIDANTS from page 8)

to the less-than-stellar results, all of which is nicely summarized by Frei: "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."

A wealth of studies has accumulated over the past several years showing that antioxidant supplementation reduces free radicals, reduces the risk of serious disease, and improves health. Anecdotaly, Linus Pauling, a pioneer in vitamin C research, lived to be 93 taking a daily dose of 12-18 grams of Vitamin C (ascorbic acid). Would the authors of the meta-analysis conclude that Pauling died prematurely at age 93 by taking ascorbic acid?

Using a wonderful analogy, Dr. Bill Misner writes, "The reason science

often contradicts itself occurs early when the methodology is designed. They can prove that gravity does not exist if the study methodology measures the falling rate of a buoyant object floating in water. Now, think about that for a minute. Stand on a ladder and jump off, landing one time. Next, take the ladder and put it in 12 feet of water. Put on a full-length water floatation suit and then stand on the same step with your head just out of water. Jump off and float away, resulting in the first study ever to prove that gravity does not exist. Next thing you will learn is about all the simple souls who hear this on the evening news are dying from jumping off high places because they read a study that statistically proved (without a doubt) that gravity does not exist..."

We believe this antioxidant meta-analysis is seriously flawed, misleading science that should not influence your

decision when it comes to antioxidant supplementation, especially given the tremendous research (some of which is listed below) that has shown the overwhelming benefits of antioxidant supplementation. All people-athletes and non-athletes alike-can benefit from daily antioxidant supplementation. It is a safe and health-promoting practice, period.

References available upon request.

To view the Sydney Morning Herald article in length check out this link : www.smh.com.au/news/health/vitamins-raise-death-risk-study/2007/02/27/1172338624454.html



Josh Liberles

Graeme Street's projects are successful because they go beyond the superficial elements of training. They take a look behind the scenes at what makes a cyclist better. This holds true whether Graeme is addressing core strength, nutrition, or the mental, motivational aspects of athletics. Working on these attributes not only makes people better athletes; it makes them into healthier, happier people.

The John Howard Cyclo-Bootcamp, held in Cardiff by the Sea, California from February 21st - 24th, was the culmination of this holistic approach. For the Bootcamp, Graeme assembled the top experts in a variety of fields. They offered information and techniques to improve his clients' cycling and, perhaps, their lives. John Howard, a three-time Olympian and multiple-time national championship winner, presented tutorials on stretching, bike fit, and cycling techniques. John's approaches are cutting-edge and he has helped numerous athletes to succeed at the international and Olympic levels. Former RAAM competitor, Steve Born, Senior Technical Advisor at Hammer Nutrition, discussed nutrition theory and the periodization of the athlete's diet. Coach Al Lyman, an elite Ironman competitor, spoke about training intelligently and efficiently. And, of course, Graeme Street did what has made him famous. He demonstrated new yoga, core, and breathing routines, and discussed techniques for mental and physical preparation for an event. Although Graeme's videos are designed to fit into his clients' busy lives, his clinics focused more on holding poses and targeting specific parts of the body. Graeme also demonstrated how routines can be cus-

tomized to meet specific needs and time constraints.

The focus of the Bootcamp wasn't limited to seminars and indoor workouts. We had come to beautiful North County (just north of San Diego) to enjoy the warm weather and ride our bikes! Each of the four days was full of great riding. The terrain included beautiful cruises along the Pacific Coast Highway, challenging twisty climbs and descents around Rancho Santa Fe, and a rolling loop through Camp Pendleton. On the road, the ride leaders further emphasized cornering, paceline and echelon riding, descending, climbing, cadence, and overall riding efficiency. Coach Al, Graeme, John Howard, Steve Born, and Josh Liberles (an elite road racer) were on the road with the campers to provide guided instruction, pointers, and examples. John Howard split the camp into groups, and took them onto a closed course for directed instruction on skills including cornering, balance, and body positioning.

The camp culminated with Saturday's epic route, where riders could choose between a hilly 35-miler that mimicked the famous "Swami's Ride," or a mountainous 82-mile adventure which climbed east into the desert. Campers completed the four days with about 250 miles of riding, plenty of yoga and stretching, and a wealth of new information to process and apply to their athletic regimen. A wonderful local caterer replenished the campers every night, serving delectable fuel for the next day's rides. An experienced sports massage therapist also was available to loosen up those road-weary muscles, for the true week-in-the-life of a pro experience.

The group of 29 cyclists, ranging from recreational-level all the way to elite-level racers, converged in southern California from places such as Vancouver, New England, the Midwest, Florida, and the Bay Area. There were also German, Italian, and Israeli accents mixed into the chatter of the peloton. Many of the riders came from colder climates, and these were the first group rides of the season for most. The San Diego sunshine, the beautiful coastline, and the salty ocean breeze caused many of our riders to practically jump out of their Sids with excitement. Their initial exuberance, however, often surpassed their early-season fitness levels, and it took a little while to get everyone settled down and sorted into cohesive groups. Once this happened, the Bootcamp began to gel. People from all over the world became friends and learned to ride together as an efficient, well-oiled peloton. This transformation and the increase in skill and comfort levels were palpable. Within a few short days, we had riders who had never ridden in a paceline going shoulder-to-shoulder in a smoothly running echelon along the Pacific Coast Highway.

Perhaps the best synopsis of the Bootcamp came from one of our clients, Gerald V., from Lakewood, California. "This camp has taught me to be a better cyclist, a better person, a better husband, and a better father. When I'm out training or racing, I will often see myself through the eyes of my sons. I want to be a good role model for them, and I live my life accordingly. I am grateful for the opportunity to be here and to work with some of the top experts in the

(continued on next page)



world. I will apply these lessons to my cycling and to my life."

As a longtime Hammer customer, Gerald was particularly excited to have some face time with Steve Born. Gerald was able to go into the nitty-gritty details of his nutrition, and to review how he was using various products in his diet and his training. Steve explained to Gerald the science behind each of the products, and the proper timing and quantities to be used. Overall, Gerald already had a very good nutrition program in place. "If more athletes used our products in the well-thought out way that Gerald does, they would get better results," said Steve. This kind of personalized

most likely to be held in Vail, Colorado the first week in July. Watch for details soon.

Rider Testimonials:

"I am a better rider for having attended this camp. It really kicked off my year for the best season ever."

"The information received, and the experience and contacts made at the John Howard Cyclo-Bootcamp will help me improve as a bicycle racer for years to come."

"It was a great week of rubbing shoulders with and being taught by some of the greatest coaches and mentors one



feedback proved to be a unique and invaluable asset to our Bootcampers.

Graeme Street further emphasized the value that Steve and Hammer Nutrition brought to the camp. "It was especially exciting to see the synergy between Hammer products and the philosophy behind Cyclo-CORE come together in the Bootcamp. It strengthens my commitment to the science behind the Hammer nutritional products. It was evident that the combination of performing the Cyclo-CORE workouts, learning from Coach Al, and utilizing the Hammer products enhanced the performances of our cyclists. Steve Born's contribution to the Bootcamp was wonderful and the participants came away with much more knowledge about the importance of combining nutrition with sound core training. I look forward to continued growth in our relationship with both Steve and Hammer Nutrition."

This was Graeme's first foray into training camps, but certainly won't be his last. The most immediate plans in the works are for a climbing camp,

could hope for. On top of that, meeting such a diverse and outstanding group of people, who share a common passion for cycling, was an exceptional experience for me."

"The camp was a great chance to meet a cycling legend (John Howard), as well as present day innovators like Graeme, Al, and Steve."

"The camp simply made me a better rider."

"The instruction was usable and exact. I could use every piece of data right away to improve my descending, climbing, endurance, and fueling. The philosophical slant was also really appreciated."

"Every day I blew myself away by surpassing what I expected of myself and my abilities."

"Steve Born's data on nutrition has totally changed my performance. Instead of wearing out and fading on long rides now it seems I can go on and on and I know what to do to handle my body's needs."



Bill Misner, Ph.D.
Director of Research
& Product
Development Emeritus

Dr. Bill's Words of Wisdom

1. How many servings of organic vegetables do you eat each day?
2. How many servings of organic fruits do you eat each day?
3. How many servings of organic cereal grains do you eat each day?

If the answers to 1, 2, 3, do not total 9 or above, then the "Green" presented in the Phytomax nutrient profile would improve your dietary habits. Though we never recommend substituting a pill for a whole food, in spite of Phytomax qualifying as a whole food "Green"... though for those who consume the American diet, it is a step in the right direction.



90 capsules
\$24.95

PRODUCT SPOTLIGHT

Energy Surge

Pure, instant energy

Steve Born



Energy Surge (formerly ATP 100)

The names of several Hammer Nutrition products tell what they provide for you, the athlete. Sustained Energy and Race Day Boost are a couple of examples in this category. Now joining them is Energy Surge, one of our “old guards,” a venerable supplement that until recently provided benefits under the name ATP 100. The name Energy Surge fits this product well, because that’s exactly what you get: a nice surge of energy exactly when you need it.

The primary source of muscle energy production is adenosine triphosphate (ATP). This molecule is part of an amazing and complicated biochemical cycle that takes place in the mitochondria, which are found in every cell of your body. ATP is the molecule that provides the immediate energy to muscle fibers. The substrates in the cycle come from our food, especially carbohydrates. However, under prolonged and intense exercise demands, mitochondrial ATP production can come up short, leaving a gap in the cycle. (See the “Ask Dr. Bill” column for more details here).

That’s where Energy Surge comes to the rescue. As Dr. Bill states, “Taking ATP in a sublingual dose when [fatigue] is sensed may act as a preventative primer for the ATP-endogenous pump.” Put another way, taking Energy Surge raises blood ATP supply to a “priming dose” when existing mitochondria cellular ATP stores are becoming depleted and when the body cannot keep up with ATP production demands.

For rapid delivery, Energy Surge is

taken sublingually (under the tongue), bypassing the alimentary system. Directly absorbed through the mucosal lining of the mouth, it has nearly instant access to the bloodstream. (This is the same mode of delivery that cardiac patients use for rapid relief from angina attacks when they pop a nitroglycerin tablet under their tongue.) Sublingual dosing is just the right method for getting the immediate boost from Energy Surge.

Not just a new name, Energy Surge is formulated with the patented PEAK ATP® brand of adenosine triphosphate. According to the manufacturer (TSI Health Sciences), it’s the “only ATP clinically tested to demonstrate efficacy... a proprietary nutraceutical ingredient which provides the exact molecule the human body needs to create energy, making it effective for a variety of clinical indications, such as energy, athletic performance and anti-aging.”

The TSI website lists the following actions and benefits of PEAK ATP®:

Actions

- Elevates ATP levels in blood and tissues
- Enhances the delivery of glucose, nutrients and oxygen to working and recovering muscles and helps remove catabolic waste products
- Regulates vascular tone to reduce pulmonary and systemic vascular resistance, without affecting blood pressure or heart rate, and enhances cerebral blood flow

Benefits

- Increases overall energy levels,

reduces fatigue, and enhances general well-being

- Benefits muscle growth, strength, and recovery, thereby improving athletic performance
- Helps combat the effects of aging by supporting cardiovascular and respiratory health and boosting mental acuity

Note: References available upon request

Energy Surge contains a full 100 mg of PEAK ATP®. Use it as needed during any event. It has applications for events as short as a 5-10k race while also being perfectly acceptable for use during specific times in an ultra event. As far as a recommended dose, it’s highly variable—“no rules, just right”—if we can borrow the term. Some athletes take a tablet every 15 minutes for hours on end with no problems at all, while others find that one an hour works best for them. Many athletes like to keep Energy Surge in reserve until that critical hill or sprint, then take one and blow out the competition. As we recommend for all supplements, you need to test it in training to determine your tolerance and specific benefit schedule.

Regardless of your event, Energy Surge gives you that extra boost exactly when you need it. For your tough workout sessions (especially intervals and speed work), and for sure during races, Energy Surge is your instant ally.

A new name and a new formulation have given this proven winner its own energy boost. If you haven’t used Energy Surge before, now is the time to give it a trial and see what a difference it can make for you.



'Unhappy Meals'

A brief overview of a must read article

Steve Born

In a recent (and lengthy!) New York Times article entitled, *Unhappy Meals*, author Michael Pollan takes on, among other things, nutrition & the food industry, and tackles the question "Why should what humans eat in order to maintain optimal health be so complicated and confusing?" The article is a fascinating read and worth the time it takes to get through it in its entirety.

While not divulging the entire contents of the article, which would take far too much time and space, Pollan's "rules of thumbs" (which are being paraphrased here) for taking the confusion out of how and what to eat to achieve optimal health are, at the very least, good "food for thought" (forgive the pun) and certainly worthy of consideration, if not altogether adoption:

1) Eat food. Pollan clarifies this by saying, "Don't eat anything your great-great-grandmother wouldn't recognize as food." With supermarket aisles being flooded with "foods disguised as food" product items, and not real food, this can be challenging. To make things easier, non-food items such as non-dairy creamer, breakfast cereal bars, and countless other similar products are, by and large, to be avoided.

2) Avoid foods that come bearing health claims because, in Pollan's words, "they're apt to be heavily processed."

3) Avoid foods that contain ingredients that are (A) unfamiliar (B) unpronounceable, (C) number more than five or contain high-fructose corn syrup. While some of these ingredients may not necessarily be harmful, they do indicate

that the product has been highly processed.

4) Get your food from local growers and not always from the supermarket. Buying locally produced organic food allows you to consume foods that retain more of their nutrient density and greater amounts of their plentiful, naturally-occurring phytochemicals.

5) Pay more, eat less. For the most part, higher quality food (meaning better tasting and more nutrient dense) simply costs more because it has been, in the words of Pollan, "grown or raised less intensively and with more care." Simply put, paying more for better quality food - and eating less food overall (calorie restriction is being touted as one of the primary practices one can take to extend life) - is one of the best investments you can make.

6) Eat mostly plants. Not everyone agrees on this but I think we can all agree that increasing our consumption of organic produce is a wise strategy. Science continually discovers more and more naturally occurring, health promoting nutrients that are found only in plants, with numerous (in the 100's) of these unique phytochemicals found in specific plants.

7) Adopt dietary habits from other cultures. In Pollan's words, "Confounding factors aside, people who eat according to the rules of a traditional food culture are generally healthier than we are. Any healthy diet will do: if it weren't a healthy diet, the people who still follow it wouldn't still be around." Pollan also suggests that in addition to paying attention to

what a specific culture eats, attention should be given to how a culture eats. Using the "French paradox" as an example, Pollan suggests that it may not necessarily be what they eat that maintains their health but how they eat it (small portions, no snacking or "seconds").

8) Grow and cook your own food.

9) Eat like an omnivore, "adding new species and not just new foods, to your diet." Pollan's prevalent thought here is that the more variety of species you eat, the more successful you will be in covering all your nutritional bases.

You can find the entire article in pdf format at www.swarthmore.edu/NatSci/peverso1/Stat%201/Unhappy%20Meals.pdf - it's certainly worth checking out.

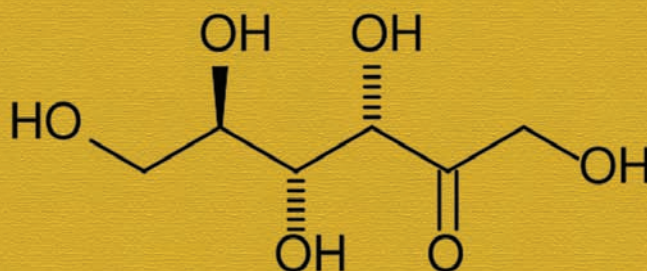
Interestingly, but not really so coincidentally, Pollan's view very much reflects our philosophy on diet, as stated by company owner Brian Frank...

"Eat whole (organic) foods as much as possible. Avoid packaged, processed foods and junk foods at all times. Do not consume any artificial sweeteners, colors, or flavors, and avoid preservatives as much as possible. Avoid all "ose" (sucrose, fructose, glucose, etc.) highly processed sugars in your daily diet and especially during exercise. These sugars are not only inefficient fuels, they're health hazards as well."

And, in Brian's words, perhaps the most important thing of all to remember: "The quality of the calories you consume ALWAYS matters."

Fructose in Energy Surge

Steve Born



Structure formula of fructose

Even though both the “Ask Dr. Bill” and “Product Spotlight” segments of this issue of Endurance News feature Energy Surge (formerly known as ATP 100), we thought it appropriate to discuss the product even further, primarily the fructose that’s listed on the label and contained in the product. We feel it necessary to address this because we received an email from one of our clients who, based on our many articles denouncing fructose as being an appropriate carbohydrate source, wonders why we included it in the product and what, if any, effect it has. Here is my (Steve’s) response, followed by Dr. Bill’s:

When it dissolves in the mouth, ATP (adenosine triphosphate) becomes acidic, yielding a sharply sour taste and burning sensation. Fortunately, only a tiny amount of fructose negates these and gives a pleasant taste. Fructose is third on the ingredient list, after magnesium glycerol phosphate. This means that each tablet contains less fructose than magnesium glycerol phosphate, and there’s only 10 mg of magnesium glycerol phosphate per tablet. Exactly how much less than 10 mg there is I honestly do not know, but I would guess that it’s probably 5 mg or less per tablet. This is minuscule; even if it were 10mg, that’s only 1/100 of a gram. For comparison, 8 fl. oz. of a popular sports drink contains 4441 mg fructose in addition to 2245 mg sucrose, 5344 mg glucose, and some other sugars. That’s a total of over 13 grams (13,000 mg) of sugars vs. at most 10mg. In other words, I’m not worried about the

fructose in the two or three Energy Surge tablets I might take during a workout. I absolutely do not believe it will have any negative effect on your athletic performance or health.

Dr. Bill writes:

Steve’s reply is entirely accurate and current.

Hammer Nutrition’s dietary protocol for athletic performance and health recommends avoiding excessive processed sugar or fructose, including high glycemic complex carbohydrates or starches. The latter two include our own gels and powders, except during exercise or in a post-workout protein-enhanced recovery meal.

Fructose intolerance or fructose excess generates systemic reactions in those so predisposed, beginning at 40,000 milligrams per day. Some people can tolerate much more without harmful effects. Humans neutralize the harmful effect of sugars by consuming the sugars with fat, fiber, fluids, and water-soluble vitamins. Consumption during exercise, when blood sugar turnover is high, also mitigates harmful effects. There is no limit on fructose intake from natural whole fruits due to fruit being relatively calorie sparse and high in fluid and fiber, which allows slow absorption and metabolism. We recommend healthy consumption of fruits for prevention of a number of health issues such as colon cancer, breast cancer, and

prostate cancer.

Here is a comparison table of the milligram values for fructose found in whole fruit versus Energy Surge. Fruits typically contain both fructose and glucose (usually 50%-50% each).

	Fructose*	Glucose*
Banana	9000	9000
Apple	9000	9000
Orange	6000	6000
Energy Surge	<5	0

*Amounts are in milligrams

Repeated doses of over 40,000 milligrams daily may evoke a fructose-intolerance reaction or harmful health effect. The minuscule effect from a few milligrams of fructose in Energy Surge, as a sublingual, will create NO effect on systemic blood lipids or glucose.



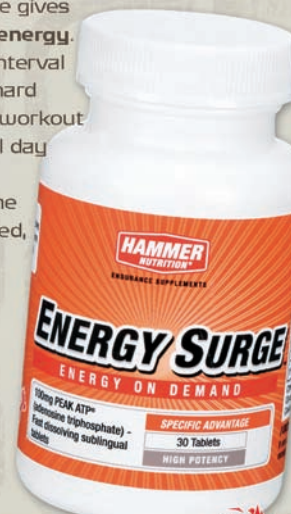
Pure, Instant Energy

Energy Surge gives you **instant energy**. Perfect for interval sessions, a hard section of a workout or race, or all day long during ultras...get the edge you need, when you need it!

Rapidly absorbed
Energy Surge

\$19.95

1.800.336.1977





Common Questions

Sustained Energy & Perpetuem



Steve Born

Q : Can I use Sustained Energy or Perpetuem in a hydration pack?

A : You could, but for several reasons we do not recommend this practice. Sustained Energy and Perpetuem contain no preservatives or mixing additives, which means that the protein will not survive long in dilute solutions. The protein component tends to separate and settle to the bottom; this means you need to shake your mix before drinking, which isn't easy when using a hydration pack. Lastly, cleaning the bladder of any hydration pack is substantially easier when you use it for drinking water only.

Q : How long will Sustained Energy or Perpetuem last after I mix them in water?

A : "Shelf life" of these powdered products, once mixed with water, depends primarily on two factors: (1) how cold you keep the mix, and (2) how concentrated you make your mix. Protein readily supports bacterial growth at warm temperatures. Depending on the temperatures, a couple of scoops in a water bottle should keep 3-5 hours; if kept cold up to 6-8 hours, perhaps even slightly longer. A very concentrated mix, such as the near paste that you squeeze out of a Hammer Flask, retards spoilage, and it's easier to keep a flask cold than a water bottle when you're exercising. Once the taste begins to sour, you probably don't want to drink a mix. Dr. Bill Misner explains: "Energy drink powders containing no preservatives are predisposed to change once set in solution mixtures. Time, temperature, humidity, environmental airborne or endogenous microbes, and oxidation factors may cause fatty acids to turn rancid or proteins to 'sour' in the presence of short or

long-chain carbohydrates. A prime example is found in pasteurized milk. Milk typically sours in stages as one type of bacteria replaces another. Bacilli convert protein into ammonia products, and the pH rises. The odor or taste of spoiled milk is apparent once this has happened. We have observed this phenomenon in our soy-based products, Sustained Energy and Perpetuem, if the product is mixed and then not kept cold or consumed within 3-5 hours. Athletes should keep pre-mixed protein-enhanced or lipid-containing carbohydrate drinks under 59F (ideally 40-45F) to prevent spoilage. Freezing the drink the night before can keep the macronutrients intact by inhibiting bacterial growth potential. Once the drink is soured to taste or has a noxious odor, we advise against consuming it."

We have found that very thick mixes provide not only the most compact way to tote your fuel, but they also provide you with fueling flexibility in that you have your hydration (water bottles or back pack) and your electrolytes (Endurolytes) separately stored and dosed. Paste-consistency mixes of Sustained Energy/Perpetuem can be frozen and easily kept cold. For workouts about three to four hours, you can do okay by mixing Sustained Energy and/or Perpetuem in water bottles. For longer workouts, especially in warm-to-hot temperatures, we recommend thick mixes in Hammer Flasks, freezing your mix bottles, and/or using insulated bottles. If you have a support crew, they can serve up cold, freshly mixed bottles.

Q : Can I use all the Hammer Nutrition fuels interchangeably?

A : Yes, all Hammer Nutrition fuels are perfectly compatible with each other and may be used interchangeably

or mixed together during a long workout or race. You can get much variety by mixing the various flavors of Hammer Gel with Sustained Energy and Perpetuem.

Q : I understand that protein becomes a source of fuel after approximately 90 minutes of exercise. If I'm doing a long distance workout or race, do I need to start with a "carb only" like Hammer Gel or HEED, then switch to Sustained Energy or Perpetuem after an hour or so?

A : No. You can use Sustained Energy or Perpetuem right from the start. If heat is a factor, you might even favor using these carb/protein fuels before they spoil, as noted above. For longer races or workouts, use Sustained Energy or Perpetuem as your sole calorie source from beginning to end, or use Hammer Gel and/or HEED occasionally, but keep Sustained Energy or Perpetuem as the primary source of fuel (approximately two-thirds to, ideally, three-quarters of the time).

Q : If I mix Sustained Energy or Perpetuem and keep it in the fridge for a day or two, will it break down any of the desired properties due to not being used right away?

A : The effectual benefits ("desired properties") are not lost, but the L-carnitine in both products may deteriorate somewhat, forming crystals within the mix since it is very hygroscopic (has an affinity for water). The deterioration, if any, is minimal in 48 hours post-mix, refrigerated. However, for best results we recommend mixing Sustained Energy or Perpetuem as near to use as possible.

Glutamine

A vital post-training nutrient for improving performance

Marni Rakes



Find a treadmill, road, or lake, and you have yourself a training destination. Tighten the laces on your running shoes, clip into your pedals, or lube-up for a wetsuit swim, and you're ready to go. When it comes to triathlon training and a desire to keep an uncomplicated plan, it doesn't take a genius to prepare the body for a triathlon. Alternate a weekly schedule of anaerobic intervals, tempo workouts, and aerobic sets, and you have yourself an ideal training plan. In addition to consistent, arduous training, you must consume a properly formulated, post-training nutrition drink to foster improvement in your fitness level. The missing step of post-training nutrition can sometimes present more of a challenge than finding that nice lake for a training swim.

Many research studies have shown that post-workout fueling is crucial for how well you will perform or train in your next session. Proper recovery means providing your body with specific nutrients to restore depleted glycogen, minimize post-training muscle soreness, and rebuild damaged muscle tissue. A post-workout drink is essential for the triathlete [any athlete!] who seeks additional performance gains after the training session has ended. Imagine an enhancement in your performance when you aren't swimming, cycling or running! There is absolutely no better time to encourage protein synthesis in a catabolic body than the first 30-minutes after training, when elevated hormone levels facilitate rapid nutrient absorption.

While a perplexing number of recov-

ery drinks are available to consumers, in essence, all sport drinks are similar. They all contain a carbohydrate source, some protein, and whatever supplementary ingredients the manufacturer adds to improve the drink's effectiveness. The consumer, nonetheless, generally chooses the most affordable, the best tasting or, the most advertised product. However, the ideal sport drink should offer only ingredients endorsed by relevant scientific research. In this category we find a wide range of Hammer Nutrition products, each of which contains the precise quantity of ingredients to foster optimal training and speedy recovery.

Among the many research-validated ingredients in Hammer Nutrition products, glutamine (found in Recoverite) might be the most important nutrient for supporting optimal recovery. With glutamine comprising over 60% of skeletal muscle tissue, the natural depletion of glutamine during training encourages muscle breakdown and immediate post-training soreness. During periods of high physical output, the body cannot keep up with glutamine production, so this essential nutrient must come from your daily food intake. To meet demands of the physical stress that endurance training produces, your body is entitled to a hefty, well-deserved post-training reward. It is essential that you supply your body with protein that not only stimulates the glycogen replenishment, but also provides the necessary amino acids to support repair and growth of damaged tissue.

For maximum benefit, consume your post-workout recovery drink in the

immediate thirty minutes after training. Supplementary glutamine in your drink will not only minimize muscle stress and promote glycogen restoration, but will also help strengthen the immune system. A rapid, adequate recovery will allow you to maintain higher intensity training and overall performance improvement. In addition to carbs, protein, fluids and micronutrients, be sure to include supplemental glutamine in your recovery nutrition.

Note: Each two-scoop serving of Recoverite contains an outstanding 3000 mg of glutamine

As a Hammer Nutrition and Zoot sponsored athlete, Marni Rakes is an active endurance triathlete who holds a Master of Science in Exercise Physiology. She is also a certified sports nutritionist through the International Society of Sports Nutrition. Currently serving as the USAT Florida Region Director, Marni is also a USAT Level-1 Coach. Marni recently finished her first Ironman (Ironman Florida) and qualified to compete in the Ford Ironman World Championships in Kona, Hawaii on October 13, 2007. Any questions regarding this article, training, or nutrition please contact mrakes1@hotmail.com and visit <http://www.trimarni.com>.

HOT TIPS

Arnica for sprains and bruises

The Arnica Montana flower, usually found in ointments, salves or tincture form, accelerates the healing of sprains, bruises and any injury when the skin is not broken. Begin applying arnica regularly to injured area as soon as possible and continue multiple times per day while practicing the RICE technique (Rest, Ice, Compress, Elevate).



Visit Montana

Experience the 'Big Sky' running or riding

Glacier National Park / Photo - Angela Nock

Steve Born

Two-Bear Marathon : A challenging course in a beautiful location

Are you a marathoner looking for a special race in late summer? Do you like scenery so spectacular that it takes your mind of the pain of a truly challenging course? If so, the Two Bear Marathon, right here in Whitefish, Montana, could be just the run you're looking for. Now in its third year, the race is slated for September 16, when our "Big Sky Country" is arguably at its most scenic, and that's saying something. Hammer Nutrition has enthusiastically sponsored this event from the beginning, and we look forward to supporting the race again this year.

According to the website, this race had its beginnings when "Three intrepid marathoners (only one of whom had a vague sense of direction), armed with topo maps, a GPS, and bear spray, spent the better part of the summer and fall of 2004 getting lost in the

Stillwater State Forest. Eventually, however, they accomplished their goal and mapped out a challenging, scenic course for a marathon. Next, they chose a weekend when the fall colors were at their peak, and the Two Bear Marathon was born."

This is a full marathon only, about half on pavement and half on dirt roads and trails. There will be no shorter runs, and the website cautions entrants to be prepared to run the whole length because "There is no easy way out." Only 300 runners will be in the field, and you must be "16 years of age or older, in good health, and well-trained. The Two Bear Marathon is a challenging course with a cut-off time of 6.5 hours (14:53 pace)." The race has its ups and downs-lots of them. As the website cautions, "The NET elevation gain is only 24 feet. Piece of cake! HOWEVER, the TOTAL elevation gain

is over 2,400 feet! If you're looking for a flat marathon, you've come to the wrong place!"

Your pain will be alleviated by HEED and Hammer Gel at the aid stations and fabulous Northwest Montana scenery whenever you can lift your head to look.

For registration and more enticing information, visit the race website at www.twobearmarathon.org. Participants from 13 states, and even one from Germany have already registered to compete. Deadline is August 13, or the first 300 entrants.

We extend our welcome to all participants to also visit our headquarters while you're here for the race. We always love getting to know our customers.

JDRF : Three rides in Whitefish in 2007

If you're diabetic, or know an athlete who is, you should know that the Diabetics and Wellness Foundation (DAWF) has deemed Hammer fuels "diabetic friendly." This distinction comes, of course, from our refusal to use simple sugars in any of our products. What's good for diabetics is good for everyone in this instance, so we're honored and pleased that we're sponsoring their rides, with proceeds supporting the Juvenile Diabetes Research Foundation (JDRF). The "Ride to Cure Diabetes" national

fundraising rides, which we have sponsored for the past couple of years, came locally to us last year. Apparently, the organizers and riders liked Whitefish so much that they've scheduled three rides here this year!

The first of their rides, on July 7th, has already been filled, but the other two still have slots available:

- August 23-26
- September 20-23

If you're looking for a great place to ride a bike for a great cause, and at a time when the riding and the scenery in northwest Montana are at their finest, sign up for one of these two JDRF rides. For more information about all the JDRF rides, including their fundraising requirements for participating in any of their rides, visit their website: www.ride.jdrf.org.

Look for Hammer staff members during the rides. Come by our headquarters too if you'd like.

ATHLETE SPOTLIGHT

Reid & Michele Delman

Gemini Adventures

An interview with Steve Born

Participants at the 2006 Desert R.A.T.S.
Photo - Reid Delman

Our spotlight for this issue illuminates Reid and Michele Delman, founders of Colorado-based Gemini Adventures. Gemini Adventures stages some amazing ultra distance running events that we at Hammer Nutrition have enthusiastically supported since 2003. If you're an ultra runner looking for a well-supported race in an extraordinary location, check out Gemini Adventures at www.geminiadventures.com.

Here's what Reid and Michele have on tap for 2007:

Spring Desert Ultra Triad Running Festival "A weekend of fun and running in Fruita, Colorado"
April 19-22 - 5, 10, 25, 50 mile races

24 Hours...the Run - "team relay and solo challenge racing series"

1. 24 Hours of Utah...the Run
Moab 100 - May 12-13
2. 24 Hours of Laramie...the Run
Laramie 100 - June 30-July 1
3. 24 Hours of Boulder...the Run
Boulder 100 - Oct. 13-14

*Desert R.A.T.S. (Race Across The Sand)
"A six day stage footrace from Grand Junction, CO to Moab, UT" & marathon
Stage race: June 17-23
Marathon: June 23*

Steve: Reid & Michele, first a little background about you. Were you both always into ultra running, or were you competitive athletes in other sports?

Reid & Michele: We both are pretty new to the ultra running scene. Michele had run a number of

marathons, and I wrestled in college with some international experience after college. We were both looking for new and bigger challenges; after I attempted the Eco-Challenge in 1996, we became involved in the Boulder running scene and were introduced to ultra running.

Steve: In your personal athletic careers, what would you say the highlight was?

Reid & Michele: We've both had many great experiences and are still striving for that highlight. Anytime you overcome a great challenge, it's a special event.

Steve: Are either of you still competing?

Reid & Michele: We are continuing to set new challenges for ourselves. I'm signed up for Hardrock 100 (Silverton, CO) in July followed by the Leadville bike and run in August. Michele is looking to do her first 100 miler; it should be a great year.

Steve: Give us a little history of the evolution of Gemini Adventures. What was the first race you put on? When did the other events come into being?

Reid & Michele: Gemini Adventures came about when Michele was pregnant with our twin daughters and I was looking to start a business from home. We always loved mountain biking and running on the beautiful trails of Fruita, Colorado and always thought it would be an ideal place for a race. In the spring of 2003, one of our favorite races was cancelled, so we quickly put

together our first 25 and 50-mile races there, then called the Spring Desert Ultra. We had a lot to learn, but we garnered tremendous support from our Boulder running community. That race has grown ever since, and is now part of the Desert R.A.T.S. series and officially titled the Desert R.A.T.S. Trail Running Festival. We've since added the Desert R.A.T.S. stage race, our more grueling, 6-day race from Fruita to Moab, Utah. This race has been a long-time dream for us: to bring a popular European racing format to the U.S. and conduct it in a way that is accessible to just about everyone. Now we've also got the 24-hour team relay and solo challenge series. These were built based on the popularity of the same format for mountain bike racers. Runners fit as many miles as they can into their 24 hours, or solo runners can choose to go for 100 miles on the same loop course. These are staged in Boulder, Moab, and Laramie, Wyoming. Our vision is to continue to build unique races set on beautiful courses, and to encourage runners to achieve their potential.

Steve: How did you come to know Hammer Nutrition products? Did you use them in your own athletic endeavors?

Reid & Michele: We were introduced to Hammer products at races and were so impressed with the results that we began using them in our training. When we put on our first race, we immediately thought of Hammer products, since these were no ordinary 10K races, and racers needed to manage their nutrition well.

(continued on next page)



Steve: Our product support for the events has increased every year, it seems, so most likely it can be assumed that the feedback you've received from the race participants regarding the product support has been pretty favorable. Would you agree?

Reid & Michele: The feedback we have received about Hammer Nutrition has been so positive that we've worked to grow the relationship every year. Hammer HEED has been especially great for our racers since the races are in such extreme heat. Runners have to keep the fluids going down, and they don't have problems with HEED. Every year racers are taken by surprise by the heat at our Trail Running Festival. It's the first hot race of the year, and runners are not ready for it. The HEED helps to keep stomach problems from developing.

Steve: Gemini Adventures has definitely grown over the past couple years. Still, even with all the events that you're producing, would you say that the Desert R.A.T.S. remains the "cornerstone" event?

Reid & Michele: The Desert R.A.T.S. was our dream from the beginning. It's such an incredible experience for both the racers and race directors. To be out there watching racers work hard, overcome challenges, and mature throughout the week is truly inspiring.

Steve: The Desert R.A.T.S. stage race sounds like a really difficult endeavor, perhaps one of the most extreme races in the US! Is it as hard as it sounds?

Reid & Michele: The Desert R.A.T.S. isn't easy for anyone, but it really is what you make of it. We've had people who have never run a marathon before and others who have competed in some of the most extreme races around the world. Some will come gunning for the 24-hour reward (first person to break 24 hours receives \$1000) while others are there to finish.

Steve: Can you give us a little

additional background on the stage race component of the Desert R.A.T.S. and how the winner is determined?

Reid & Michele: The Desert R.A.T.S. is a six-day stage race where we supply everything for the racers - food, tents, transporting supplies, etc. Day One is 20 miles, Day Two is 39 miles, and Day

Gemini Adventures

Three is the shortest stage of the race, at 9 miles. 52 miles makes up the total distance of Days Four and Five and, as we state on our web site, "This stage is what this race is all about." Day Six, the final stage, is 26.2 miles, the standard marathon distance.

The winner is determined by adding all the stage times. On the last day the leader starts the stage with the lead-time he has earned, so the first person to cross the finish line wins the whole race.

Steve's Note: The six-day race is a total distance of 146.2 miles, with the marathon run in conjunction with the six-day race. Last year's stage race winner, Allen Bellshaw, completed the course in 24:00:18

Steve: In 2008 you're going to be putting on the Mountain R.A.T.S. (Race Across The Summits) race. What can you tell us about this race?

Reid & Michele: This is going to be a four-day, self-supported race (we'll transport sleeping bags, supply water and tents) through the Colorado Rockies. The exact course isn't set. We're working on the permits, but it will be a beautiful course with some great challenges. More information can be found at www.geminiadventures.com/mtrats

Steve: It appears that some, if not all of your races take place in hot temperatures... true? If so, what was the hottest race in Gemini Adventures' history?

Reid & Michele: The heat adds a unique challenge to the races, but it's more about the landscape. There is nothing like the beautiful terrain near Moab. Every year the Desert R.A.T.S. gets into the triple digits. Last year was our first year having it in June. We spent a lot of time over 100 until a cold front came through and cooled it down into the 80s. Our hottest temperature we've recorded was 106, but I think it could get hotter this year.

Reid & Michele, thanks so much for your time, and for having Hammer Nutrition as an integral part of your great races again this year. Best wishes for another successful year!

HOT TIPS

DIY Recovery Drink

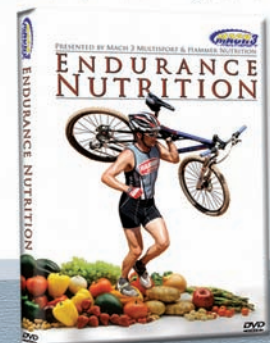
For some, the stevia sweetened Recoverite doesn't float their boat. For others, a specific recovery drink is just too much - No matter which group you fall into, here's a simple recipe for a quick, easy post workout recovery drink. It yields the same 3:1 ratio of carbs to protein found in Recoverite:

1/2 scoop of Hammer Whey
8 ounces of fruit juice
Contents of 1-2 Endurolyte capsules
(or 1-2 scoops of Endurolytes Powder)

Mix together, drink immediately after completing workouts and races.

Proper Diet and Fueling Guarantee Success!

Informative DVD featuring Steve Born



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Al Lyman, CSCS

Many North American endurance athletes consider the beginning of April the time to get serious with training and race preparation for the upcoming competitive season. However, for some athletes the beginning of April marks the time when a glance at the calendar reveals only a few weeks remain until the first event, leaving them in a state of shock and absolute panic.

If this is the case with you, think first before you start hammering high intensity intervals in a vain attempt to find the fast track toward improved race readiness. Avoid the trap of thinking there is a quick fix, short cut, or easy path toward a true higher level of fitness. Push too hard, too fast, too soon, and you're more likely to find the path to acute or over-use injury.

Building the stamina and strength that leads to success in endurance sports takes time and patience; it's a slow, continual process of musculoskeletal and cardiovascular adaptation. However, if you pay close attention to the fundamentals such as skill and technique enhancement and general/functional strength, you can make some great inroads in relatively short time that will help get you closer to achieving your goals.

Two aspects of training you should attend to now are maximizing your daily nutrition and daily recovery from training. It's easy to forget these critical aspects of training during the off-season, but they're especially important if you are training hard right off of your waking from hibernation. It goes without saying that if you don't eat well most of the time and at the right times, and if you don't recover adequately between training

sessions, your training, fitness, health, and race preparation will stagnate, or even worsen. Recovery and nutrition are vital to maximizing your workouts.

Here are three "April Tips" to help get your season started right:

1. Review your current Limiters and then set Training Objectives to improve and overcome those Limiters. Limiters are specific weaknesses that could prevent you from being successful in your most important events.¹ Likewise, Training Objectives are measurable training goals, based on your Limiters, which you set for yourself with the goal of improving upon them.

To help in this process, ask yourself these questions:

- What are my strengths and weaknesses? Am I even aware of my Limiters?
- Is there a chance that one or more of my Limiters will hold me back in certain events?
- What progress did I make in the off-season in addressing these?
- Did I miss anything in the off-season preparation that I should focus on now?
- What am I doing right now to improve my Limiters and prepare for upcoming key races?

April is a good time to develop key workouts, those that have a specific and material impact on your race specific fitness, to address your weaknesses. Be patient and persistent, and set measurable goals (training objectives) so that when you line up for your most important event this season, you will have the confidence of knowing you did all you could

to prepare for success.

2. Focus on executing KEY WORKOUTS by differentiating intensity and being purposeful in all of your training: If you want to improve your race performance, you must execute your key workouts to the best of your ability. Avoid the "rat race" mentality, which has you chronically running from one workout to the next without any real focus. This will yield fatigue and increased stress, not improved health and fitness.

3. Eat as well as you can, most of the time. Eating the best foods to nurture your health and recovery, most of the time and at the right times, is the best path toward optimizing health and body composition. Endurance athletes often wait until they are close to their goal races and then try to get lean and "race ready." Once you begin to do higher intensity, race-specific training sessions, your body will be under greater duress. Limiting calories at this time will stress your body even more, and can lead to injury and undoing all of the work you are doing to improve!

These three tips will only work if you remember a very important but often forgotten concept: listen to your body and trust your intuition. Your intuition may be the most important tool you have in your toolbox as an endurance athlete; unfortunately many of us don't listen to it when we need to the most. If you are a novice, your intuition might not be as highly developed as your more experienced training partners or friends, but it is there and is often talking to you. Your "inner voice" might be telling you that

(see COACH AL on page 21)



2007 Race Across America



2000 and 2001 Women's RAAM Champion, Cassie Lowe

Steve Born

It's still early April as I write this, and many races await us on the calendar. One in particular, though way off in June, already has the full-time attention of competitors, crewmembers, officials, and organizers. I'm talking about the "big one," the Race Across America (RAAM), which starts June 10 for the solo riders and two days later for the teams. Once again, and in a greater capacity than ever before, Hammer Nutrition will sponsor the race that Outside Magazine labeled "the world's toughest sporting event."

This year's RAAM will operate under new ownership/management, led by Fred Boethling who completed the 2006 race at age 61, becoming RAAM's oldest solo finisher. Terry Zmrhal, another RAAM veteran, takes over the race directorship, and Jeff Stephens, yet another RAAM vet, will handle sales and marketing. Admittedly, there's been some insider controversy over the restructuring, but the race itself looks to be as sound as ever.

In the solo field, 23 men and 5 women have already signed up. The Traditional division has 20 men - including last year's champion, Daniel Wyss of Switzerland - and 3 women competing. Three men and two women will compete in the Enduro division, introduced last year. The Traditional division is the straight-across race

from beginning to end, while the Enduro division requires an average of four hours a day off the bike, with several mandatory stops.

Besides the solo riders, RAAM also has several team categories. The two-person teams include seven male teams, one female, two mixed, and two more male teams riding recumbents. The four-person division currently has one female team, an outstandingly high 16 male teams, and two mixed teams. If memory serves me correctly, this is a record high for this division, which should ensure an exciting and highly competitive race. The eight-person Corporate team division has eight teams entered so far, including last year's champion, Hammer Nutrition-sponsored Team Type 1. As the name implies, all of the cyclists have Type 1 diabetes.

This year's RAAM route runs very similar to last year's, beginning in Oceanside, California, and 3044 miles, 108,600 feet of climbing, and 12 states later, finishing in Atlantic City, New Jersey. As you can imagine, the racers will encounter many terrain and weather changes.

The difficulties begin on the first day as the racers cycle through the blazing Mojave Desert, past Salton Sea (elev. - 227') and then meet the daunting,

longer-than-long climb up Chiriaco Grade outside of Palm Springs. More hot, dry desert and rangeland follow, and then come the Rocky Mountains, with several legendary climbs: Yarnell Grade in Arizona, and the Colorado "torture trio" of Wolf Creek Pass (10850'), La Veta Pass (9413'), and Cuchara Pass (8600'). It's slightly downhill and mostly flat all the way to the Mississippi Valley, though the Midwest can be blazingly hot as well (and most always quite windy!). After a week or so on the road, the riders are greeted by numerous short but steep climbs in eastern Ohio, West Virginia, Maryland, and Pennsylvania. Even if you hate the glitz, Atlantic City is a welcome sight!

The majority of RAAM competitors are from the US, but RAAM truly is an international race with entrants hailing from Australia, Austria, Brazil, Canada, Czech Republic, France, Great Britain, Hungary, Italy, Portugal, Slovenia, and Switzerland.

This year's RAAM, with so many first-timers entered in the race, looks to be one of the most competitive and interesting races since its inception in 1982. We at Hammer Nutrition are extremely excited to be involved again this year. For more information about RAAM, including continual updates, check out the website, www.raceacrossamerica.org.

(COACH AL from page 20)

you are tired and just don't feel up to that ride or run that you had planned or that what you are eating isn't optimal to support your training or health.

Your body is smart. If you learn to really listen to it, stay patient, and focus on the fundamentals, you'll get

your season started right and perhaps have your best season ever. Best of luck!

1 Friel, J. The Cyclist's Training Bible, Boulder, CO: Velo Press, 2003, p. 75.

Coach Al Lyman, CSCS (Certified Strength and Conditioning Specialist), is the owner of Pursuit Fitness and is a Joe Friel Ultrafit Associate. He is

also certified with USA Triathlon, USA Cycling, and the National Strength and Conditioning Association. Widely known as the creator of the popular Cyclo-CORE™ Off-Season and In-Season Training Plans, Al is a three-time Hawaii World Champion and has completed eight Ironmans. For more info, email coachal@pursuit-fitness.com or go to the PF website at www.Pursuit-Fitness.com



A New Approach To Medical Thought

Lowell Greib

As some of us debate whether we should pull the bike off the trainer and brave the sandy roads for the first time this season, others have already been accumulating mileage in preparation for the upcoming summer athletic season. Whatever the case may be, we all look forward to increasing mileage and our athletic prowess. It is this enthusiasm, however, that may lead to injury and possibly loss of the ability to participate in the sport we love.

There is a growing concept in complementary medicine encouraging doctors and therapists alike to think differently about the delivery strategies of medical interventions. Some of us may go for our yearly checkup with our family doctor (although many don't) and leave things at that. Are you one of these people? There is a misconception that one doesn't need any further treatment because nothing hurts. In fact, many disease processes, including the ever-troubling musculoskeletal complaints, have preludes that are subtle, and many of us don't even know they are happening until it is too late! Does a diabetic become one overnight? I don't think so. Does heart disease occur in a blink of an eye? Absolutely not! Do muscle injuries always occur due to sudden trauma? Nope! We need to think of our bodies as ever growing and ever changing. As athletes, we are much more in tune with our bodies than most people, but we are not infallible, and we are definitely not invincible.

We don't have to wait until problems arise. The new system of medical thought invites us to be proactive rather than reactive. We can call this prehabilitative medicine rather than rehabilitative medicine!

Prehabilitative medicine is a multidisciplinary, multi-factorial approach that includes the individual as well as the health care providers. Let's take a quick look at how we can use this model to take control of our health and subsequently provide ourselves with the athletic success that we strive to achieve.

I tell every single person that I have the privilege to work with that "the success of treatment is ultimately in your hands." Understanding and taking control of this philosophy will empower you, not only to be a better athlete, but also a healthier person in general. You are the first component in the prehabilitation model.

There are several things that we, as individuals, need to think about. Being the dedicated sport enthusiasts that we are, we tend to underestimate the value of some of the "little things." Athletics is much more than just hammering as hard as we can from point A to point B. True athleticism is a function of longevity and being able to maintain performance in the sport that we love. Are you doing everything in your power to achieve longevity? I suspect many of us must answer "No" to this question. Take some time through this transitional season to evaluate whether you are eating properly, exercising properly, goal setting, actively and passively recovering, and most importantly, being proactive about your health. Spring is the time of year where we brush off the cobwebs from our equipment, and also from ourselves. Here are five things you may want to keep in mind as you prepare for summer activity...

1) Ramp your volume up strategically

to avoid overuse injuries.

2) Change your diet accordingly, to maintain appropriate caloric and nutrient consumption.

3) Make sure that you are taking time away from athletics to enjoy life. Find an activity that is "grounding" and may offer both active and passive recovery (my personal favorites are yoga and qigong).

4) Get the appropriate amount and quality of sleep.

5) Build your own prehabilitative plan.

The second component to prehabilitative medicine is the engagement of a range of medical professionals, therapists, and coaches in your program. It is the expertise of these individuals that should assist you in achieving your goals. If you are not getting the help that you want or deserve, you may simply need to locate a different professional. The list that you may want to consider (although not exhaustive) may include your family doctor, naturopathic doctor, optometrist, chiropractor, massage therapist, physiotherapist, dietician, personal trainer, and personal coach. It is also important for all these professionals to be able to put ego aside and work together as a team. After all, it is you, the client, whom we are working for! You need the aforementioned people for their knowledge and expertise. If they don't have what you are looking for... don't see them! You need to pick your team based upon what is going to be best for you. Just as you are responsible for certain components of your preparation for summer activity, your health team is responsible for others:

1) Get your yearly physical done. This is a great screening tool to ensure that

(see MEDICAL on page 23)



Join Us In Kona!

Brian Frank

OK, we know that with it only being April, this is a super early announcement. However, considering that some of our overseas clients have already qualified for Kona, and knowing that some of you will as well, we thought we'd announce it now (and don't worry, we'll post this information again!).

Anyway, if you're planning on being in Kona during October, for whatever reason, we'd like to invite you to join us.

We are renting a house on Alii Drive, where we will hold an "open house" for our clients and athletes to come by, hang out, and fuel up Monday, October 8 through Friday, October 12 from 9 AM – 5 PM. We'll have tables set out all day with fresh, local fruit and other healthy snacks to compliment the full array of Hammer products that will be available. I'll be there to go over or fine tune your race day fueling strate-

gy, answer questions and provide any other support needed.

We will not be running the open house on Saturday, the day of the race, however, Angela is planning on being on course to take photos of all of the athletes wearing our kits.

So if you're going to be in Kona, come on by, relax, get some fuel, and hang out for awhile. The open house will be staffed by Brian Frank and his family, Kadidja Infelise, Sponsorship Director and Angela Nock, Senior Graphic Artist.

Feel free to stop by, we'd love to meet you.

Here is the pertinent info, more to come as necessary:

Hoku'Ea Hale, the "Turtle Gate House" 78-6640 Alii Drive Kailua, Kona Mile marker 4 1/2 4.5 miles south of town (Kailua)

P.S. We'll also be running a similar open house in Penticton, British Columbia, August 22nd through the 25th. You are also invited to this open

house if you are planning on being there.



(MEDICAL from page 22)

your body systems are functioning properly and that underlying pathologies will be discovered early on.

2) Have a complete musculoskeletal assessment done. It is surprising how many athletes feel fine, but have active biomechanical issues that eventually lead to injury. I may also suggest having a therapist who is versed in trigger point therapy, radiculopathic pain management and acupuncture. This combination is effective in treating muscle pain (whether acute or chronic) before it becomes a limiting injury.

3) Massage is a great tool to assist with recovery. Soft tissue massage may be aggressive, and at times painful. Lymphatic massage may

offer benefit as well, and is much more relaxing. Determine your best modality and pick your therapist accordingly. Some massage therapists offer hydrotherapy as well. There is nothing like a sauna before a deep tissue massage!

4) Review your training program with your coach. Does it meet the goals that you want to achieve? Does it fit your schedule? Be sure that it is achievable and that you have an amicable relationship with your coach, since this is probably the professional that you will spend most of your time with.

By utilizing some of the above thought processes and taking your overall

health seriously, I suspect you will fulfill your goals and furthermore, be able to do so for some time to come.

Lowell Greib is a naturopathic doctor and biochemist with an interest and expertise in sport medicine, injury prevention, pain management and athletic nutrition. He is the chief medical officer for Mahigan Medicine and operates private clinics in Huntsville and Orillia, 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 info@mahiganmedicine.com or toll-free at 1-877-624-4633.

Nate's Corner



Andy Schultz / Photo - Jay Thane

Nate Llerandi



*Steve's Note:
Per usual, I've
"unearthed" some
vintage "Tip of the
Week" posts from
Nate. The first one
dates way back to
April 2001 and the*

*second from April 2003. However,
though they may be a few years old, I
think you'll agree that they're still very
appropriate, especially for this time of
year. Enjoy!*

Changing of Focus

Now that the racing season is upon us, the focus on your training should be shifting. You either have peaked in your weekly hours or will do so soon, depending on when your key races are.

Also, you will be shifting to more anaerobic work and less aerobic. The majority of your training is still aerobic - 80% or more - but this should be considerably less than during the winter, when maybe 95% was aerobic. With the increase in intensity, there should be a leveling off or decrease in weekly training hours (up to 20%). This decrease in hours compensates for the increase in intensity. If you schedule deliberate recovery weeks every 4th or 5th week, you can get by with more hours and more hard training. If you still don't include rest weeks of reduced hours (around 50 -60% of normal weeks) and reduced workloads (90-100% aerobic - below 75%), then you should think about it. Nothing derails great fitness like over training.

Finally, it's time to start cutting back on weights. If you've been lifting

3 days a week (hopefully not more than that), then it's time for 2 days. The fall and winter was the time to make gains in your strength. With 2 sessions a week, you should still make some gains. But you need to reduce the amount of weight work you're doing now that you're increasing your intensity in your primary sport(s). Soon, it will be time to reduce your weight routine to once per week, probably in another 4-6 weeks. At that point, the goal is simply to maintain the strength gains you've made, not to build on them. Too much weight work will break you down and keep the muscles from recovering properly as the rigors of the racing season pile up.

It's Never Too Late

The racing season has already begun for some of us; for others of us, it is about to begin. For all of us, key races are still ahead. As the year progresses, there always seems to be a point where an athlete thinks, "This is as good as my fitness is going to get this year." It's a common thought, but how accurate is it?

There is always a way to improve your fitness. Every step of the way, every training cycle you complete, you need to take a look at the hard work you did, analyze it and then best put together your next cycle of training. It is not necessarily as easy as putting one building block on top of another. If you peter out during your long rides, have you figured out exactly why? Is it something nutritional or is something lacking in your training? During your 30-minute tempo runs,

are you putting in a strong, consistent effort the whole time or are you dragging by the time the 30 minutes are up? If you're dragging, again, why?

It might be as easy - might - as moving on from your Base training to your interval work, or what have you. But different intensities of intervals and varying lengths of intervals will build different results. Do you need to work on your power or your ability to hold a steady effort at or near your Lactate Threshold?

And, if you're in the middle of your interval work, maybe the key to getting faster won't be to do more interval work, but rather to take a break from interval work to focus more on another aerobic-centric cycle of training. If your raw speed is there but you can't hold a high-intensity effort for a sustained period of time, your aerobic capacity could be lacking, for example.

What I'm getting at is that your training progression may very well NOT be linear. Wouldn't things be easy if it were? But, usually, it's not. We try like heck to make our plans linear because it's easy to implement and follow. Just make sure you have the vision to change things on a dime if you find yourself bumping up against a wall in your training and/or racing. Identify the wall and then give yourselves the tools to break it down.

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



Endurance Nutrition

Informative DVD with Steve Born



Steve Born

"How many calories should I take in during an event?"

"What should I eat before a race and when should I eat it?"

"How do electrolytes improve my performance?"

"How can I avoid bonking during a race?"

Nutrition expert and ultra endurance cyclist, Steve Born, answers these and many other questions inside Endurance Nutrition. Gain top advice

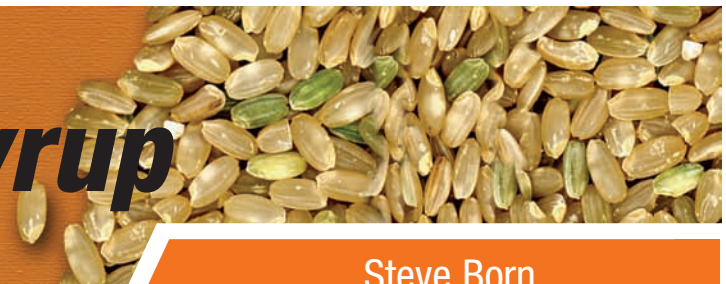
on how you can dramatically improve your training, racing and health through a simple, well thought out endurance nutrition plan.

As an endurance athlete, whether you're a cyclist, triathlete, cross country skier or anything in between, you put a tremendous amount of time and effort into training for your sport. But even with the best coach and top of the line equipment, you may never reach your peak if you're short-changing the third pillar of your training regimen — your nutrition plan. Inside Endurance Nutrition, Steve puts it all together

with easy-to-follow steps that endurance athletes of all levels can understand and relate to. From his 5 keys to a healthy eating strategy and 7 steps to fueling during an event to his advice on pre-race and post-workout meal strategies, you'll find something that will take your endurance performance to the next level!

Get your free copy with any order over \$50. Just ask your client services advisor or put a note on your web order asking for your FREE DVD.

Brown Rice Syrup



Steve Born

We regularly receive questions like these regarding this commonly used carbohydrate source/sweetener:

What is brown rice syrup?

Is it anything like the maltodextrin in Hammer Gel?

How good is it?

Answers: Food processing companies use brown rice syrup for their sweetening and flavor attributes. Clearly, putting "brown rice syrup" on the label adds an air of healthiness and perhaps

also a suggestion of natural complex carbs. In fact, brown rice syrup is about 50% complex carbs (maltodextrins), 46% maltose (a simple sugar), 3% glucose, with the remainder being various other constituents.

Brown rice syrup is made from fermented cooked rice. The rice is cultured with enzymes to break down the starches. The resulting liquid is then boiled down to the desired sweetness and consistency. Variations in the process mean that there are actually many brown rice syrup products. In general, they contain about half mal-

todextrins and half simple sugars. This makes them a better sweetener than pure maltodextrins. But endurance athletes are not interested in sweeteners; we're interested in fuel. We prefer maltodextrins as fuel, and no simple sugars. Maltodextrins absorb into your alimentary system much more readily and give you consistent energy with minimal blood sugar fluctuation. Plus, brown rice syrup costs about three times as much as long-chain corn maltodextrin.

(REPLENISHMENT from page 1)

amounts. They drum up statistics such as “you lose up to two grams of sodium per hour, burn up to 900 calories hourly, and sweat up to two liters an hour” to defend their position. Even worse is that, in many instances, they don’t give any numeric guidelines, just vague statements like “drink as much as you can.” Sadly, far too many athletes fuel their bodies exactly this way - based on the recommendations of what one elite athlete may be using and/or saying - with only poorer-than-expected results or a DNF to show for their efforts.

What these “experts” don’t take into account when making these “replace what you lose” recommendations is that how much you’re losing - fluids, calories, and sodium - is totally secondary to what you can effectively replace. In other words, what you are burning/losing is not what you should be focusing on, but rather what the body can reasonably assimilate during any given period of time. Two statements by Dr. Bill represent our position on what proper fueling is all about:

“To suggest that fluids, sodium, and fuels-induced glycogen replenishment can happen at the same rate as it is spent during exercise is simply not true. Endurance exercise beyond 1-2 hours is a deficit spending entity, with proportionate return or replenishment always in arrears. The endurance exercise outcome is to postpone fatigue, not to replace all the fuel, fluids, and electrolytes lost during the event. It can’t be done, though many of us have tried.”

“The human body has so many survival safeguards by which it regulates living one more minute, that when we try too hard to fulfill all its needs we interfere, doing more harm than good.”

In other words, the body already “knows” it is unable to immediately replenish calories, fluids, and electrolytes at the same rate it uses/loses them, and it has the ability to effectively deal with this issue.

What this means is that the body cannot be replenished at the same rate that it becomes depleted. Yes, the body needs your assistance in replenishing what it loses, but that donation must be in amounts that cooperate with normal body mechanisms, not in amounts that override them. Here’s an important fact to keep in mind (paraphrasing Dr. Bill) - At an easy aerobic pace, the rate of metabolism increases from a sedentary state to a

range of 1200-2000%. As a result, the body goes into “survival mode” where blood volume is routed to working muscles, fluids are used for evaporative cooling mechanisms, and oxygen is routed to the brain, heart, and other internal organisms. Interestingly, it is NOT focused on calorie, fluid, and electrolyte replacement, as some of the “experts” advise.

In other words, the body already “knows” it is unable to immediately replenish calories, fluids, and electrolytes at the same rate it uses/loses them, and it has the ability to effectively deal with this issue. That’s why we don’t recommend trying to replace hourly losses of calories, fluids, and electrolytes with equal amounts, but instead recommend a smaller replenishment donation, one that cooperates with normal body mechanisms. We’ll discuss this in more detail later in the article.

Fueling variability among athletes

Over the course of two decades, we’ve had the opportunity to observe the fueling habits (consumption of fluids, calories, and electrolytes) of thousands of athletes. Needless to say, these fueling protocols have varied tremendously. Here are some of the variations we have observed:

ELECTROLYTES : The female winner of a past Leadville 100 mile ultramarathon won the event by over an hour (beating most of the men as

well) consuming merely one Endurolytes capsule per hour. Her electrolyte profile (done via blood labs) taken before the event was remarkably the same after the event. At the other end of the scale, one triathlete client of ours regularly consumes up to 8 Endurolytes per hour in his iron distance triathlon events. At 6 Endurolytes per hour, which is an upper-end dose for most athletes, he cramps or presents with gastric upset.

FLUIDS : Fluid intake with the athletes we’ve observed varies between 12-40 fluid ounces per hour.

CALORIES : Calorie intake also varies considerably, with intakes ranging from 200-700 calories per hour.

With that in mind, of the athletes who have contacted us to report success (no fuel-related, performance-inhibiting problems), the following characteristics occur with remarkable consistency:

- Fluid intake is under 30 fluid ounces/hour
- Electrolyte intake is between 3-6 Endurolytes/hour with 4 Endurolytes/hour being the most often reported successful dose
- Calorie intake is at or under 300 calories/hour
- Body weight at finish is decreased between 2-3%

Of the athletes who have contacted us regarding their less-than-hoped-for race performances, for those that are directly related to fueling, one or more of the following characteristics are almost always noted:

- Fluid intake is nearly always over 30 fluid ounces/hour

- Body weight at finish is hyper-hydrated with weight gain from +1-2% or dehydrated at over -3%.

NOTE: A 2% body weight loss reflects the water loss when glycogen stores are metabolized; over 2-3% weight loss or weight gain leads to hyponatremia problems.

- Excess calories, primarily from the use of simple sugared-based fuels, which raises osmolality in the gut, forcing the body to pull electrolytes out



of an already electrolyte-depleting system, causing stomach shut down.

- A diet that reflects the typical American high sodium diet. Those who consume that type of diet are predisposed to taking a higher sodium electrolyte during an event than the low sodium purist.

NOTE: Not only are high sodium diets bad for your health, but those who consume high amounts of sodium in their diet are guaranteed greater sodium loss rates and require greater sodium intakes during exercise. Sodium, as you know, drives thirst, and thirst drives drinking until excess results... definitely not a performance-enhancing scenario.

- Primarily for ultra distance athletes (but also applicable for all athletes) - A common report from ultra distance athletes who suffer cramps, sour stomach, malaise, and/or hyponatremia in the last half of their ultra can be related to not having trained with high enough total weekly mileage and/or not having completed at least one training session at 50-60% of the ultra distance using the same fluids-fuels-electrolytes dose. Then, during the event the athlete either uses a different protocol than they trained with or, just as bad, they demand that their body suddenly adapt to the race distance, pace, and time when their body's systemic enzymes for those fluids-fuels-electrolytes demands are underdeveloped due to lack of duration training. Bottom line: Athletes need to not only train appropriately leading up to their race, they also must test, evaluate, and fine-tune their fueling plan in training prior to using it in a race.

NOTE: Sweat composition studies performed by Shephard, Noakes, Costill, Moody, and others have shown, in a variety of stress exercise forms, that an acclimatized, fit athlete loses half of the electrolytes and fluids as an un-acclimatized, unfit athlete does.

Event-specific training in both duration and intensity halve electrolyte and fluids requirements in an endurance event.

What you should derive from all this is that while there is not a "one size fits all" fueling formula, there are some very clear guidelines in terms of

what has been shown to be successful for athletes, with remarkably consistent observations (read: fueling errors) noted from athletes who had unsuccessful races.

What does the research show in regards to fuel replenishment?

This is a suggested comparison showing approximated upper values for what is lost during prolonged endurance exercise to what can be successfully absorbed, replaced, and routed into the energy cycle for the majority of fit, acclimatized endurance athletes:

TABLE 1

SUBSTANCE	LOSS RATE	REPLACEMENT RATE (Gastric Emptying Rate)
Fluids	(1-3 liters)	17-28 fluid oz.
Sodium	2000 mg/hr	500-700 mg/hr
Fuel (Carb Cal)	700-900 Cal/hr	240-280 Cal/hr

TABLE 2

UNIT	% REPLACED
FUEL	30-40%
FLUID	20-33%
SODIUM	20-35%

This material was extracted from the following literature:

- Noakes T.D., Lore of Running. Leisure Press. Champaign Illinois. Pages 768-770 29 published and unpublished papers cited on fuels, fluids, electrolyte issues during endurance exercise.
- Moodley D. et al., Exogenous carbohydrate oxidation during prolonged exercise. The effect of carbohydrate type and solution concentration. Unpublished manuscript in #1 above.
- Sweat Composition in Exercise and Heat. Verde T, Shephard RJ, Corey P, Moore R, 1982 J Appl Phys 53(6) 1541-1542.
- Sweating: Its composition and effects on body fluids. Costill DL, 1977 & 1982, Annals of the New York Academy of Sciences, 301, p.162.
- American Dietetics Association Position Statement
- American College of Sports Medicine Position Statement

As you can see, there is a tremen-

dous difference between what is lost and what can effectively be replenished during exercise. For calories, only 30-40% of what is utilized ("burned") can be efficiently replenished. Fluids are replenished at a rate of only 20-33% of what is spent, and sodium 20-35%. What's important to keep in mind is that the body is keenly sensitive to this, recognizing its inability to replenish what it loses at anywhere near the rate that it's losing it.

In regards to calories, body fat stores satisfy upwards of two-thirds of energy requirements, very easily making up the difference between what is burned

and what the body can accept in replenishment. For most athletes, calorie oxidation rate and gastric absorption rate typically allow for no more than 300 calories per hour to be consumed for successful gastric absorption to energy transfer. Adding over this amount typically induces undigested calories in the gut, which contributes to two undesirable outcomes: (1) no calories crossing intestinal linings, and thus, no additional energy, (2) increased potential for a number of stomach/digestive distress issues to occur.

In regards to fluid volume and sodium, both are controlled to a degree by pathways between the human brain and internal organs, precisely monitored and moderated by kidney and hormone signals initiated from the brain, causing re-circulation when levels are detected low. In other words, keeping in mind the words of Dr. Misner, the body has remarkably complex and efficient "built-in" survival safeguards that very capably deal with the difference between what it loses and what it can accept in replenishment. The body does this primarily through the release of specific hormones in the circulation, anticipating losses in favor of (A) life-giving, death-preventing survival, (B) neutralizing blood pH, and (C) balancing fluid, fuel, and electrolytes. This compensates for all but about 20-30%, which is what can be replenished via fluid/electrolyte consumption.

(see REPLENISHMENT on page 35)



Brian Frank

Brian, Mark & Etienne ride in Tucson / Photo - Evan Lawrence

On February 20 - 25 the inaugural Hammer Camp was held in sunny Tucson, Arizona. Based on my recollection and the feedback from the participants, it was more of a success than any of us had hoped for. The experience was so undeniably positive - both for organizers and participants - that we're already in the process of scheduling more Tucson-based camps to be held in December, January and February. In addition, even more ambitious plans are being made for camps in Europe in 2008. More on all of that in a future Endurance News article, but first, back to the Tucson camp.

As with everything we do, from the annual Highline Hammer event, designing products, to taking your order over the phone, our goal is to "over deliver" on every one of your expectations. So, when we ask you to pony up \$1,650 for a five-day camp, we've got a lot more in store than you can ever imagine. Due to a very last minute cancellation, we ended up with 11 campers. Our staff consisted of myself and Jim Bruskewitz doing the coaching, and our Cycling House hosts Evan Lawrence (Cat 1 pro), Owen Gue (Cat 1 Pro) and Andy Schultz (Pro XC mtb racer).

From arrival to departure, everyone received the individual, personalized attention that I would want and hope for if I was in their position. Think of a five star hotel level of service for athletes. Everyone was surprised by the homey, familial atmosphere they encountered at the Cycling House. This feeling only intensified as everyone got to know each other better and had time to relax and unwind from their normally hectic routines. Some commented that it felt more like a

bunch of friends had rented a house and were hanging out together as opposed to a student/teacher camp.

Those who sent bikes ahead found them already hanging in the garage, ready to ride with assembly notes and service recommendations when needed. Andy served as head mechanic and did major service such as overhauling a rear hub, repairing a bottom bracket and truing wheels, as well as keeping every bike aired up, lubed and ready to ride each morning. Everyone enjoyed having the extensive on site bike work.

We got everyone settled and had our first real meal at Tuesday night dinner. That was the next surprise for all the attendees as we feasted on wholesome, gourmet creations that were hearty, healthy and exploding with flavor. These healthy feasts continued daily and were enjoyed immensely by all, especially me.

Evan made sure there was plenty of strong, hot coffee

every morning and throughout the day. The aroma in the garage, which also doubles as the shipping area for 53x11 Coffee, was a constant reminder of how good their coffee is. Most campers took a few bags home and are now enjoying Evan & Owen's flavorful blends daily.

Although the weather was unusually variable by Tucson standards, it did not interrupt our riding at all. Every morning, after allowing our hearty and healthy breakfasts to digest, we set out on our two- to six-hour rides. Owen, Andy and Evan took turns driving the sag vehicle with the other two providing support from their bikes. Friday's approximately 25-mile climb up Mount Lemmon (9,157 feet above sea-level) was the most challenging and anticipated. We were rewarded with an epic climb that featured freezing weather and snow flurries.

Some campers did "digestion" runs before our rides while others took advantage of Jim's expertise in the pool with stroke technique and individual evaluations. Time was also allocated for the same type of technique demonstration and gait



Out among the cacti



Hammering out the miles

(continued on next page)



evaluations. Both the swim and run training was a big hit for the triathletes.

For everyone, the biggest treat was getting away from their daily grind and just living a primarily "training and nutrition only" routine for five straight days. We followed a schedule, but it was a loose schedule and no one fretted about starting a ride 15 minutes late, going longer than planned, or minded killing some extra time by reading a book. Along the way, there were many other discoveries that the camp attendees will benefit from all year long.

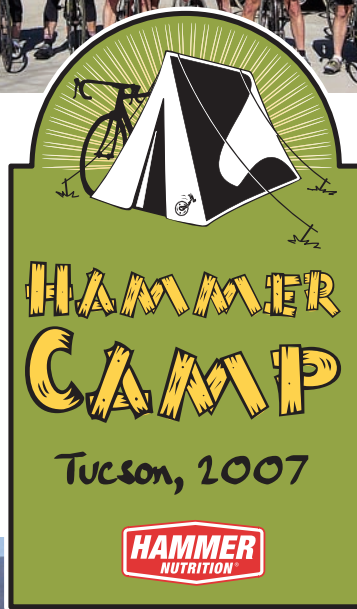
Some realized how much better you feel when you eat healthy all day, every day. Some discovered that they had been habitually over consuming calories during longer workouts, while others found that they need to practice maximum caloric intake, even on short rides, to handle their hyper metabolic tendencies. Everyone was impressed by using proper post-workout recovery techniques, not the least of which was discovering how refreshed a set of crispy legs feel after completing a 24-minute Active Recovery program with the Compex e-stim unit.

We sent each camper a questionnaire and asked them to rate the camp from every angle. A scale of 1-5 was used, 5 being the highest score possible. A "5" was given in almost every category by almost every camper. In addition, we received the following testimonials in reply to our question about the biggest take away from the camp:

"The experience was undersold. I had no idea that Owen, Evan and Andy would be providing such good service and ride support or that there would be that type of educational component. As you can tell from my ratings, I had a great time and would suggest that you shouldn't change anything about the camp."



One of the many wonderful rides



Getting in some Arizona sun

"Four big take aways: Compex, swimming stroke, biking leg position and running stride. Each has had a huge impact on my training and performance. I now eat more salad and am more aware of my nutrition during exercise. Absolutely exceeded my expectations. I'd do it again in a heartbeat. I would also consider other venues."

"Perpetuem - the ability to concentrate and customize it to suit my riding/exercise needs and use it exclusively for my caloric intake needs."

"Great experience. If we need more campers next year and need any recommendations, I'll be glad to provide them. It was a great mix of people and I think everyone enjoyed each other's company. Here in central

Wisconsin, 95% of the time I train by myself, and this was such a pleasant change to train with other people. Next year, I'm bringing more warm clothes and am going to flatten Mount Lemmon a couple times. I just don't want to freeze my butt on the way down."

"All the boys were great hosts; their parents should be very proud of all of them. Matt and I didn't really expect to have a sag wagon and mechanical assistance, so it was a pleasant surprise. I hope their 53x11 Coffee business really takes off."

All in all, this inaugural Hammer Camp was a resounding success and, as mentioned earlier, plans are already being implemented for future camps, not only in Tucson, but in other locations (including overseas). We'll keep you posted on any and all developments in future editions of Endurance News.

**Read about upcoming
Hammer Camps
on page 33!**

(COMPLEX CARBS from page 1)

the results of these studies would be applicable in faster paced, longer duration bouts of exercise. The exercise intensity of the cyclists in the majority of studies was only 50-55% maximum power output, which we'd all agree is very much a recovery pace, if that. In addition, several of these studies were performed at durations of 120-150 minutes, which is arguably not truly "endurance length."

At a leisurely 50% VO2 Max pace, an athlete can digest even cheeseburgers and pizza with no gastric issues (at least no more than usual!). However, at 70%VO2 Max pace, increased heart rate and core temperature will divert blood to the active muscles, reducing blood volume available to the alimentary system. Digestive capacity and efficiency drop significantly.

After two decades we have found that in the overwhelming majority of the athletes we've worked with - athletes engaged in typical 75-85% efforts and/or in multi-hour endurance events - the combination of simple sugars and long chain carbohydrates, and in amounts higher than 1.0 - 1.1 grams per minute (4.0 - 4.6 calories per minute), have NOT yielded positive results. They did, however, increase performance-inhibiting stomach-related maladies.

Lowell Greib MSc ND explains: "... the rate limiting step in carbohydrate metabolism during exercise is NOT liver metabolism. Simply put, it is gastric emptying. If your stomach can't empty the product (no matter what it is) you are going to get nothing from it except a huge gut ache and possibly lots of vomiting! Unless there is new research that I am unaware of, gastric emptying is directly proportional to the osmolality of the solution in the stomach. Long chain carbohydrate (maltodextrin) contributes less to increasing

the osmolality than do disaccharides (sucrose, lactose, maltose, etc.)."

Augmenting Greib's statements, Dr. Bill Misner writes, "Absorption rate and how fast the liver can 'kick it out' are limiting factors. No matter what you eat, how much or how little, the body provides glucose to the bloodstream at a

rate of about 1 gram/minute. Putting more calories in than can generate energy taxes gastric venues, electrolyte stores, and fluid levels. Maltodextrin (complex carbohydrates) can be consumed at a higher rate (15-20% solutions) than simple high glycemic sugars (6-8% solutions) due to the extraordinary osmolar pressures produced in the human gut by short chain simple sugars. When osmolality goes above 300 or below

280 mOsm, the gut must pull minerals and fluids out of the serum circulates to mediate a narrow 280-300 mOsm range for immediate calorie absorption."

With that in mind, here is a portion of research regarding the superiority of complex carbohydrates as compared to simple sugars.

Glucose Polymers [Maltodextrins] Empty The Stomach Faster Than Simple Sugars

Background: The energy density of a nutrient drink is one of the main factors that affect the gastric emptying of the solution, while osmolality and viscosity are thought to have only a minimal influence.

Method: The rate of gastric emptying of two isoenergetic carbohydrate solutions with different osmolality and viscosity was determined using a double sampling gastric aspiration technique. Six healthy male subjects were studied on two occasions using approximately 550 ml of a solution containing 13.5% of carbohydrate either in the form of a mixture of

monomeric glucose and short chain glucose oligomers (G-drink) or of long chain glucose polymers composed of 78% amylopectin and 22% amylose (C-drink).

Result: The half emptying time (t(1/2), median and range) for the viscous, markedly hypotonic (62 mosmol/kg) C-drink was faster (17.0 (6.2-31.4) min) than for the moderately hypertonic (336 mosmol/kg) G-drink (32.6 (25.2-40.7) min). The amount (median and range) of carbohydrate delivered to the small intestine was greater during the first 10 min after ingestion of C-drink (31.8 (15.8-55.9) g) than after ingestion of G-drink (14.3 (6.8-22.2) g). However, there was no difference in the blood glucose (P = 0.73) or serum insulin (P = 0.38) concentration at any time point after ingestion of the two test drinks.

Conclusion: The results of this study show that the carbohydrate present in C-drink, although it has the propensity to form a gel, empties from the stomach faster than that of an isoenergetic carbohydrate solution (G-drink) without potentiating increased circulating blood glucose or insulin levels.

Reference: *Improved gastric emptying rate in humans of a unique glucose polymer with gel-forming properties. Leiper JB, Aulin KP, Soderlund K. Sc and J Gastroenterol 2000 Nov;35(11):1143-9.*

Gastric Emptying Rate Favors Maltodextrins Over Glucose

The high prevalence of gastrointestinal complaints in long-distance runners makes this type of exercise suspect of disrupting normal gastrointestinal function. Gastric emptying rate is one indicator thereof. In the present study trained volunteers performed similar repeated fluid ingestion tests while running and while bicycling for 80 min at 70% VO2max. Control tests at rest were also conducted. Two drinks containing carbohydrate were tested, one hypertonic, and one isotonic. Artificially sweetened water was used as a control.

Gastric emptying rate of the isotonic drink, expressed as a percentage of the volume in the stomach at the beginning of each measurement period, did

After two decades we have found that in the overwhelming majority of the athletes we've worked with...the combination of simple sugars and long chain carbohydrates... have NOT yielded positive results...



not differ between cycling and running during the first 40 min and was faster during cycling than during running between 40 and 80 min. With the hypertonic drink no differences between cycling and running were observed. In comparing gastric emptying rates after each sequential bolus, at rest, the isotonic drink was observed to maintain a high emptying rate, equal to that of water, whereas the hypertonic drink emptied more slowly after the first 20-min period. A similar pattern was observed during both running and cycling. The isotonic drink continued to empty quickly after the initial 20 min, whereas GE rate of the hypertonic drink decreased after the initial 20 min.

Reference: *Effects of exercise and carbohydrate composition on gastric emptying.* Neuffer PD, Costill DL, Fink WJ, Kirwan JP, Fielding RA, Flynn MG, *Med Sci Sports Exerc* 1986 Dec 18:6 658-62.

Calorie Absorption Rate Is Superior Using Maltodextrins

In four mini pigs a segment of the proximal jejunum was temporarily isolated and perfused with two enteral diets containing isocaloric amounts either of glucose or maltodextrin. With regard to total energy, the diets were composed of 60% carbohydrate, 20% protein and 20% fat. The perfusion rates were 60, 120, 240, 360, and 480 kcal/hour. Absorption of glucose and fat from the maltodextrin diet was significantly greater than from the glucose diet, whereas absorption of protein was only slightly enhanced. A net water absorption occurred at perfusion of the isotonic solution with maltodextrin. Perfusing the hypertonic glucose diet, water was secreted. Therefore the flow rate increased from oligomer to monomer glucose source. With enhanced flow rate sodium secretion increased. However, the sodium concentration of the effluent was determined more by the transepithelial water movement than by the sodium secretion. The present results indicate that in enteral diets with interactions among different nutrients there is a 'kinetic advantage' in glucose absorption from maltodextrin compared to glucose. However, the reduced flow rate of the maltodextrin diet due to the

lower osmolality contributed to the enhanced absorption.

Reference: *Glucose and maltodextrin in enteral diets have different effects on jejunal absorption of nutrients, sodium and water and on flow rate in mini pigs.* Weber E, Ehrlein HJ, *DTW Dtsch Tierarztl Wochenschr* 1998 Dec 105:12 446-9.

Body Fluid Osmolality Caloric Values Of Sugar And Long Chain Carbohydrates

Gastric Transit Rates Favor Maltodextrin During Exercise

Type of Fuel	Calories provided at 280-300 mOsm. osmolality
Glucose	0.2 cal/ml
Fructose	0.2 cal/ml
Sucrose	0.4 cal/ml
MALTODEXTRINS	1.0+ cal/ml

When Glucose Concentrations Exceed 6%, Gastric Stress Occurs [Glucose Polymers Absorbed At 18%]

This study compared the effects of ingesting 6% (MC) and 12% (HC) glucose/electrolyte beverages, and a flavored water placebo (P) on markers of fluid absorption, palatability, and physiological function during prolonged intermittent cycling in the heat. On three occasions, 15 trained male cyclists performed two 60 min cycling bouts at 65% VO₂max (E1 and E2). A brief exhaustive performance ride (approximately 3 min) was completed after E1 and E2, and after 20 min recovery (P1, P2, P3). Every 20 min, subjects consumed 275 mL of P, MC or HC. The first drink contained 20 mL of D₂O, a tracer of fluid entry into blood plasma. Plasma D₂O accumulation was slower for HC than for P and MC (P less than 0.001). HC caused more nausea (P less than 0.01) and fullness (P less than 0.05) than MC or P, and subjects said they would be less likely to consume HC during training or competition (P less than 0.10). Sweat rates, HR, Tre, Tsk, VO₂, and PV were similar for all drinks. Performance of P1, P2, P3 were not different among drinks. However, four cyclists failed to maintain the prescribed work rate dur-

ing E2 for HC but only one failed for MC and P. These data suggest that the slow absorption of a 12% glucose/electrolyte beverage during prolonged intermittent exercise in the heat may increase the risk of gastrointestinal distress and thereby limit performance.

Reference: *Effects of ingesting 6% and 12% glucose/electrolyte beverages during prolonged intermittent cycling in the heat.* Davis JM, Burgess WA, Slentz CA, Bartoli WP, Pate RR., *Eur J Appl Physiol Occup Physiol* 1988;57(5):563-9 [Exercise Biochemistry Laboratory, College of Health, University of South Carolina, Columbia 29208.]

Glucose Causes Greater Drop In Blood Sugar Than Maltodextrins

The effects of preexercise hyperinsulinemia on exercising plasma glucose, plasma insulin, and metabolic responses were assessed during 50 min cycling at 62% VO₂max. Subjects were fed a 6% sucrose/glucose solution (LCHO) or a 20% maltodextrin/glucose solution (HCHO) to induce changes in plasma insulin. During exercise, subjects assessed perceived nauseousness and light-headedness. By the start of exercise, plasma glucose and plasma insulin had increased. In the LCHO trial, plasma glucose values significantly decreased BELOW the baseline value at 30 min of exercise. However, by 40 min, exercise plasma glucose and insulin values were similar to the baseline value. Exercise plasma glucose and insulin did NOT differ from baseline values in the HCHO trial. Ingestion of LCHO or HCHO was not associated with nausea or lightheadedness. It was concluded that the hyperinsulinemia induced by pre-exercise feedings of CHO did NOT result in frank hypoglycemia or adversely affect sensory or physiological responses during 50 min of moderate-intensity cycling.

Reference: *Glycemic and insuline-mic response to preexercise carbohydrate feedings.* Seifert JG, Paul GL, Eddy DE, Murray R, *Int J Sport Nutr* 1994 Mar 4:1 46-53.

(see COMPLEX CARBS on page 35)

6th ANNUAL *Highline Hammer* Are you ready?

Brian Frank

Starting the climb up Logan Pass / Photo - Kelly Pris

The 6th Highline Hammer plans are already in full swing. This is an amazing event and all who have experienced it have wanted to return the following year. In fact, some have done it every year since we began. We have a very limited number of spots remaining, so if you are interested, please call now to reserve one - (800)336-1977. You can also find complete details on the event by going to www.hammernutrition.com/highline. There you will find more photos, logistics details and much more.

The cost is \$400 per person. This covers all food (gourmet, healthy) from Thursday morning through Sunday brunch. Unpacking, building and repacking bikes, unlimited Hammer fuels and supplements for the duration, shuttles to and from the hotel and to and from Glacier on Friday, SAG support, including tubes, etc. on all rides and more.

We will be riding between 250 and 300 miles in 4 days with 15,000 + feet of elevation gain in the process. While this is not a professional stage race, or anything close to it, a good degree of fitness and endurance experience is needed to be able to handle this volume of training comfortably so that you can enjoy yourself, not just survive and/or hold up the group too much.

Here are some criteria that we think will ensure you have a good time and allow you to be a synergistic part of the experience:

- Ridden several centuries, or longer.
- Have at least 1,200 miles of riding

since January by the time you arrive.

- Be comfortable riding in a large group, or at least be strong enough to ride off the back without getting dropped (we ride two up or single file most of the time).

- Be comfortable riding the white line (staying to the right, out of the middle of the lane).

We're not trying to intimidate you, we just want to avoid having clients who are unprepared for the event. If you are comfortable with these criteria, please contact us right away to reserve your slot.

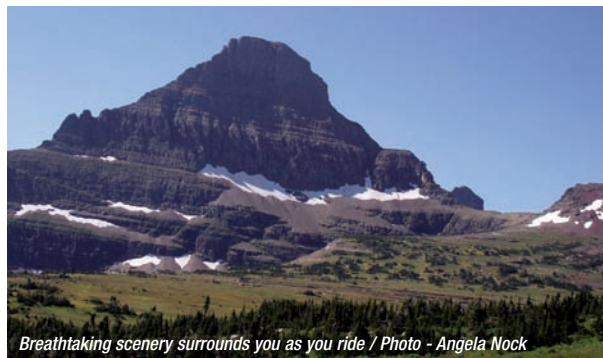
2007 Highline Daily Itinerary:

Wednesday - meet and greet 4:00 to 6:30 PM - dinner in town at various restaurants of your preference. The cost of this meal is not included.

Thursday - ride in the morning for about 2 hours, very easy pace. All afternoon - round table discussion addressing fueling and nutritional needs with Steve for first time attendees. Dinner at headquarters, 6:30 PM.

Friday - Ride the Highline, 136 miles, 11,000 feet of elevation, cross the Continental Divide twice. 9 1/2 hour time limit. Epic! Big dinner at headquarters - long day!

Saturday - It's going to happen! - "A" Group to ride around Flathead lake (87 miles, 5,000 feet of rollers



Breathtaking scenery surrounds you as you ride / Photo - Angela Nock



Crossing the Continental Divide for the first time during the ride... you'll do it twice!
Photo - Matt Wingate



Some of the local wildlife / Photo - Angela Nock

(continued on next page)



and beauty beyond description, "B" Group to ride Star Meadows. Dinner at headquarters.

Sunday - Flathead Valley loop, 3-4 hours, flat, easy pace, followed by brunch at headquarters. Event wrap-up by 2:00 PM. 3:00 to 6:00 PM airport runs.

Feedback from past participants:

"This year's Highline Hammer was like a cycling summer camp filled with great rides, friends, delicious food, and time away without any hassle. From start to finish the organization of this weekend was flawless. All in all an awesome weekend enhanced by the Hammer staff and the beautiful mountains." - Steve C.

"Very well organized, staff was incredible - servicing all our needs, getting to use new products under actual riding conditions was great, food was top notch - delicious. Weather was perfect, views breathtaking, very diverse group of people - some incredible athletes, great fun meeting everyone and hearing their stories. A 5-star get away. So fun to meet all the people I talk with on the phone when placing orders etc. Great job, thank you for a wonderful ride weekend." - Caroline S.

"A great concept. My favorite part was riding with Steve (3x RAAM, Ultra Cycling Hall of Fame, Double 508) on the final 42 miles of the Highline loop and seeing a Brown Bear cross the road 4 miles to the finish!" - Suzy D.

"Outside of the incredibly supported ride through Glacier National Park, the best part for me was meeting & interacting with people/athletes of such diverse skill and accomplishment levels; all of whom appeared like regular down to earth people with no attitude or chip on their shoulders. I found it incredibly refreshing how hospitable and friendly the whole Hammer staff was." - Lorne S.

"My favorite part of the 2006 Highline Hammer was the climb up over Logan Pass, or was it all the beautiful scenery and riding conditions? It might have been the endless supply of Hammer products to sample and experiment with? The nutrition and endurance seminars? Good food? Good company? Great price? I can't decide...don't change anything." - Lewis W.



Heaven's Peak looms in the background as you climb up Logan Pass.
Photo - Angela Nock

"A fun weekend topped off by a challenging but fulfilling ride on Saturday through one of the most beautiful National Parks in the nation. Great camaraderie among participants and a friendly, giving Hammer staff. Food was great and having meals at the Hammer site in a relaxed atmosphere was special. Being able to try all the Hammer products to experience how effective they are was testimony to everything I've been reading about them." - Ron L.

Do you want to be a part of the 6th Annual Highline Hammer? Spaces are limited so call today to reserve yours! **1.800.336.1977.**

For more information check out www.hammernutrition.com/highline.

2007-2008 Tucson Hammer Camps : Plan now!

Start making plans now to join us for one of these educational, fun and exciting camps. Space is limited to 12 campers per camp and we expect them all to fill quickly, so here's the scoop. All of these camps will be held at the Cycling House facility featuring our signature gourmet healthy meals, 5 star service, full sag support, pro domestiques, on site massage, Compex demos, endless supplies of Hammer fuels and supplements, and plenty of tasty 53 x 11 Coffee products.

Camp # 2 – December 4th - 9th.

Pre-Christmas, post season, de-stress camp. Steve Born and Brian Frank will be hosting a completely unstructured event. Coach Jim Bruskewitz will be on hand to provide coaching as needed. Daily rides will range from 3 to 8 hours at conversation pace, with wide route variety and major emphasis on scenic and beautiful landscapes. There will be plenty of one on one time with Steve and Brian throughout. Pool time and runs will be offered as well.

\$225/day = \$1,125 per person.

Camp #3 – January 15th - 20th.

New Year's Resolution base miles camp. Long daily rides with extra miles for anyone who wants them. Limited run and swim coaching will be offered. One on one goal setting and nutrition/fueling strategies.

\$250/day = \$1,250 per person

Camp #4 – February 15th - 20th.

Structured format with one on one coaching and nutrition/fueling guidance, goal refinement and objective evaluations. Many of the attendees from our inaugural camp (see article on pg. 28) are planning to return, so this one will fill first.

\$300/day = \$1,500 per person

For more information or to reserve your slot in any of these camps, go to www.hammernutrition.com/camps

Grasky/Hodska Training Camp

Brian Grasky

The road up to Mt. Lemmon in Tucson / Photo - Brian Grasky

Grasky/Hodska “Escape the Cold” Long Course Training Camp, another successful Hammer sponsored camp!

After reviewing all the contents of this issue of EN, it very much appears that this could be called the “camp issue,” considering that we’ve discussed two of them already! Here’s one more camp that Hammer Nutrition was involved in. The following is a letter we recently received from sponsored athletes/coach, Brian Grasky who, along with fellow Hammer sponsored athlete/coach Eric Hodska, recently conducted the March 17-24 training camp...

Dear Brian -

The Tucson Camp is in the books. We had a very successful camp and I want to thank you for your support of the Grasky/Hodska Training Camp.

The nine athletes ranged from Hawaii qualifiers to rookies and everything in between. We had businessmen from the northeast looking for good weather, serious Ironman competitors looking to ride outside after putting in 5-hour trainer rides, and military officers looking for consistency; but all got along great together and had two collective goals -to learn about themselves and to get in some good training. The camp was able to provide all of that.

We couldn’t have done it without your support. I can say with certainty that every athlete is now well-versed in Hammer Nutrition products and usage. We supported every workout with HEED, Hammer Gel and

Recoverite, and with the combination of athletes in from the northeast and 90+ degree temperatures, the Endurolytes were a life saver. The fact that every athlete walked away with Hammer product was an added value and led to not only the success of the camp, but also led to each camper becoming a believer in your products.

Thank you also for the water bottles you sent. As you can imagine, you go through a lot of water with athletes from the northeast when it’s 95 degrees outside, as it was on the first days of the camp. We had enough so we had some filled and in coolers in the sag truck for survival situations.

Over the seven days we hit the pool four times for coached sessions, ran three big bricks, had two stand-alone runs, and climbed over 16,000 vertical feet on the bikes.

Our biggest measure of success is that the campers walked, or hobbled, away happy. Well, that and the fact that next year’s camp already has 12 signed up! I look forward to a continued partnership with you, and getting the word out in our camps and in my racing!

Brian Grasky



The group takes a photo break during their ride



Time for relaxation after Mt. Lemmon

HOT TIPS

Avoid vitamin “repeats”

If you have a problem with supplements coming back to haunt you in the hours after taking a dose, try taking all of your vitamins midway through lunch. Exercise-specific supplements like Race Caps Supreme and Mito Caps should still be taken 30-60 minutes prior to exercise. Consume these supplements with water only if your workout will extend beyond 90 minutes as this will help prevent muscle glycogen stores from being depleted too quickly (refer to the article The Pre-Race Meal for more information regarding this topic). If your workout is 90 minutes or under it's fine to consume your pre-workout supplements with your fuel of choice, such as HEED or Hammer Gel & water.



(REPLENISHMENT from page 27)

Our basic recommendations and summary

Based on what science has shown us, plus two decades of working with athletes, we have determined the following amounts of fuels to be appropriate for maintaining optimum exercise performance:

- Fluids - 20-28 ounces hourly
- Sodium chloride - 300-600 mg hourly (3-6 Endurolytes)
- Calories - 240-300 calories hourly

Of course, there are many individual variations that you will need to consider (age, weight, training/racing stress, fitness, acclimatization levels, weather conditions) to determine what works best for you. Some athletes will need less than these suggested amounts, a handful slightly more. Additionally, it's important to remember that it's absolutely necessary to NOT stubbornly or slavishly adhere to a set hourly fuel intake when (A) the weather is hot, and/or (B) during high-impact exercise, such as the run portion of a long-distance triathlon. In these instances, you cannot fuel your body in a "business as usual" way; you need to be flexible with your fueling plan, altering it in respect to these particu-

lar circumstances. In hot weather conditions this usually translates into a lower hourly calorie intake, a slightly higher fluid intake, and an increased intake of Endurolytes. When engaged in high impact exercise such as running, this translates into a lower caloric intake per hour (roughly 30%-50% lower) than what you'd normally consume during a less jarring form of exercise such as cycling.

All this said, the above-listed figures are the amounts - the "gauges" if you will - that are a good starting point for you, amounts we feel will serve you the best in your workouts and races.

We have been publishing this information for a number of years. Sadly, many athletes continue to listen to persons and organizations telling them that they need to consume what they lose, arguing that it needs to be replaced immediately in the event. This simply is neither true nor possible; fluids, calories, and electrolytes cannot be replaced 100% but only around 20-30%. Unfortunately, athletes continue to experience cramping, vomiting, gastric distress, diarrhea,

and other problems as a result of following this flawed advice, attempting to replace all the fluids, fuels, and electrolytes (especially sodium) they lose at the rate they were lost.

When it comes to fueling, we cannot emphasize enough that less is better than more, and rather than trying to get your fueling requirements resolved by attempting to replace hourly loss with hourly intake, we suggest small dose portions at between 20-30% of what is lost. Along with longstanding research

regarding this subject, two decades of successful experience with athletes testifies to the reliability of the "less is better", "fuel in cooperation with your body" concept of fueling. Yes, there are people who can complete events on high intakes of fluids, calories, and electrolytes, but the overwhelming majority cannot, or they would do substantially better with less. Needless to say, athletes who listen to our plea to use less witness their fueling-related problems ending while watching their performance improve dramatically.

When it comes to fueling, we cannot emphasize enough that less is better than more...

(COMPLEX CARBS from page 31)

Glycogen Absorption Rate Enhanced By Longer Chain Maltodextrins Carbs

Glycogen deposition in liver and muscle is significantly greater in rats fed a diet containing barley malt extract than in those fed diets containing glucose or starch. We investigated whether particular components of malt extract (glucose oligomers, inorganic salts, protein) were responsible for this effect. Food-deprived rats were fed diets containing carbohydrates of different chain lengths [glucose, maltose, maltodextrins or malt carbohydrates (84-86 g/100 g)] in the presence and absence of inorganic salts (2 g/100 g) and maltodextrin diets (78 g/100 g) containing either no protein or 20 g casein/100 g. Dietary glucose oligomers caused higher blood glucose concentrations than consumption of glucose or

maltose but had no significant influence on liver or muscle glycogen. Salt addition resulted in higher muscle glycogen concentrations but had no effect on blood glucose or liver glycogen. Hepatic glycogen concentrations were significantly greater in rats fed casein compared with those fed no protein. Consumption of malt extract has the following advantages over consumption of diets containing glucose or maltose: 1-better glucose absorption related to the presence of glucose oligomers, 2-greater hepatic glycogen concentrations associated with the protein in malt extract, and 3-greater glycogen concentrations in muscle due to the presence of inorganic salts.

Reference: *Dietary components of malt extract such as maltodextrins, proteins and inorganic salts have distinct effects on glucose uptake and glycogen concentrations in rats. Flückiger-Isler R, Mörikofer-Zwez S, Kahn JM, Walter*

P, J Nutr 1994 Sep 124:9 1647-53.

Conclusion

The mechanisms favoring an isotonic solution of 15-18% glucose polymers enhanced with electrolytes, so as to prevent negative hypertonic solution influence, appear obvious from the literature reviewed. Since it has been observed that simple sugar solutions elevate osmolar pressures above body fluid levels [280-303 mOsm] significantly, their inefficient absorption rate occurs in endurance events where an athlete consumes too much volume simple-sugared solution in order to resolve thirst, fatigue, or electrolyte depletion. While the same negative events may potentially occur when too much glucose polymer [complex carbohydrate] solution is ingested, it appears less likely simply due to the favorable isotonic properties of long chain carbohydrates.

From the Archives

Bill Misner, Ph.D.

QUESTION : This past weekend I used ATP during an 8-hour endurance event. I used more tablets than I have ever taken previously and have a few questions. First, is there a maximum dosage? I used one tab dissolved under my tongue before some of the more grueling climbs during the event, which there were plenty. In all, I took about six ATP tablets over a time span of about 8 hours.

Second, I seemed to have some minor stomach discomfort after taking the ATP tabs. Nothing serious, but it was noticeable especially later in the event. I was using Sustained Energy/Hammer gel in multi-hour bottles with HEED in my hydration pack and some plain water in another bottle.

For what it's worth, I made sure that every tablet had fully dissolved and I never swallowed or chewed any of them.

ANSWER : The human body's total endogenous [originating within the body] ATP is roughly 100 grams. This substance is the core ingredient by which muscle energy production is dependent. Oral dose ATP is highly acidic. During exercise the stomach tends to become more acidic with lower

pH or more stomach acid volume, or potentially both. This is why we advise marathon runners to avoid orange slices at the 20-mile mark of a marathon, since the initial effect of an orange is citric acidic-effect on the gut that may cause onset of stomach cramps. This is also why we advise athletes to test the ATP sublingual dose in prolonged training to determine tolerance levels late in the event when the 100-gram ATP stores may decrease or run thin.

ATP is produced in the mitochondria through lengthy complex chemical-enzyme reactions and though they occur rapidly in a fraction of a second, there are times when ATP-substrates with their respective enzymes are delayed or deficient for producing energy. This is when the athlete senses fatigue increasing to a bonk-point. A valid comparison is when one is thirsty going to a well requires priming the well pump in order to get a drink of water. The sublingual ATP is intended to fill the energy deficit gaps that can occur when the body is stressing to produce energy upon extreme demand. Taking ATP in a sublingual dose when this is sensed may act as a preventative primer for the ATP-endogenous

pump. However, if some of the ATP is swallowed and already acidic stomach environment has the potential for gastric spasms or cramping. I suggest keep ATP dose in sublingual channels as much as possible... in other words do not swallow it.

As an addendum/hint, Perpetuem is the most alkaline energy drink I know of and with its 8.8 pH, consuming a swallow of an 7-10% Perpetuem solution may resolve acid born stomach cramps reported. This is a suggestion for you to confirm first in a prolonged training effort in order to allow you to consume more ATP without stomach side effects. This response will vary between subjects. Some can consume ATP by the hour while others cannot; always confirm compatibility dose in prolonged training.



Bill Misner, Ph.D.
Director of Research
& Product
Development
Emeritus

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Endurance Fuels

Hammer Gel Jug	\$18.95	3 @ \$16.95
Hammer Gel Single Serving	\$1.15	
Hammer Gel Pouch Sampler	\$9.95	
Hammer Gel 12 Pouch Box	\$12.95	
Hammer Gel Flasks	\$1.50	

Flavors : Apple-Cinnamon, Banana, Chocolate,

Espresso, Orange, Unflavored, Raspberry, Tropical, Vanilla

Hammer Bar	\$2.49	
Hammer Bar 12 Count Box	\$29.88	

Flavors : Almond-Raisin, Chocolate Chip

HEED - Single Serving	\$1.49	
HEED - 32 Serving	\$18.95	

Flavors : Lemon-Lime, Mandarin, Unflavored

Endurolytes	\$18.95	3 @ \$16.95
Endurolytes Powder	\$18.95	3 @ \$16.95

Sustained Energy - Single Serving	\$2.49	
Sustained Energy - 8 Serving	\$15.95	
Sustained Energy - 30 Serving	\$49.95	4 @ \$44.95

Perpetuem - Single Serving	\$2.29	
Perpetuem - 16 Serving	\$21.95	
Perpetuem - 32 Serving	\$39.95	

Flavors : Orange-Vanilla, Unflavored

Recoverite - Single Serving	\$2.29	
Recoverite - 32 Serving	\$44.95	
Recoverite Shaker	\$4.95	
Hammer Whey - 24 Serving	\$24.95	4 @ \$21.95
Hammer Soy - 24 Serving	\$21.95	4 @ \$18.95
Liquid Endurance	\$22.95	3 @ \$19.95

Endurance Supplements

Anti-Fatigue	\$17.95	3 @ \$14.95
Appestat	\$29.95	
Boron	\$14.95	
Chromemate	\$9.95	
Digest Caps	\$12.95	
Energy Surge (ATP100)	\$19.95	2 @ \$17.95
Mito Caps	\$24.95	
Phytomax	\$24.95	3 @ \$22.95
Premium Insurance Caps	\$29.95	
PSA Caps	\$24.95	3 @ \$22.95
Race Caps Supreme	\$54.95	3 @ \$51.65
Race Day Boost	\$14.95	
REM Caps	\$19.95	3 @ \$17.95
Super Antioxidant	\$39.95	3 @ \$34.95
Tissue Rejuvenator	\$24.95	
Xobaline 30	\$12.95	
Xobaline 90	\$29.95	

Carlson's Salmon Oil 60 Count	\$7.95	
Carlson's Salmon Oil 180 Count	\$19.95	
i-Flora	\$24.95	

Kits

Short Course Starter Kit

\$69.95 You save \$8.64

1 jug of Raspberry Hammer Gel, 8 pouches of Hammer Gel, 6 Lemon-Lime HEED packets, 6 Mandarin Orange HEED packets, 3 Recoverite packets, 1 bottle of Endurolytes, 1 Quick Coin, 1 Flask, 1 Waterbottle and a Fueling Handbook

Long Course Starter Kit

\$79.95 You save \$9.44

1 jug of Raspberry Hammer Gel, 8 pouches of Hammer Gel, 6 Sustained Energy packets, 6 Perpetuem packets, 3 Recoverite packets, 1 bottle of Endurolytes, 1 Quick Coin, 1 Flask, 1 Waterbottle and a Fueling Handbook

Hammer Gel Sampler Kit

\$9.95

One pouch of each flavor. Nine total.

Hammer Powder Sampler Kit

\$9.95

One packet each of Recoverite, Sustained Energy, Perpetuem, HEED Lemon-Lime, HEED Mandarin Orange, and an Endurolyte trial packet (6 capsules)

Daily Essentials Kit

\$99.95 You save \$9.90

1 PIC, 1 Race Caps Supreme, 1 Mito Caps

3 Month Daily Essentials Kit

\$289.95 You save \$49.60

3 each PIC, Race Caps Supreme, Mito Caps

Technical Innovations

E-Motion Roller System	\$795.00
------------------------	----------

Basic Power Cranks	\$899.00
X-Lite Power Cranks	\$1049.00

Compex Sport*	\$899.00
Compex Fitness Trainer*	\$499.00

Compex Replacement Electrode Pads	
Small Pads (2" x 2" - 4 per pack)	\$9.95
Large Pads (2" x 4" - 4 per pack) While supplies last	\$9.95
12 packs for	\$99.95

You save \$19.45. Mix & match sizes as needed

24 packs for \$179.95

You save \$58.85. Mix & match sizes as needed

Replacement Parts

Leadwire (Set of 4)	\$19.95
Battery pack	\$39.95

*Each Compex unit comes complete with 1 set of 2"x2" electrodes, 1 set of 2"x4" electrodes, leadwires, user manual, training planner CD, the electrode placement booklet, battery charger, and a carrying case. Pricing subject to change, please call or go online for best pricing.

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City, State, Zip: _____

Phone: _____ E-Mail: _____

Method of Payment: ☐ Check/MO ☐ Visa ☐ MC ☐ Discover ☐ AmEx Exp. Date: _____

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Card#: _____ Verification #: _____ Signature: _____

Description (Indicate flavor choices)	Size	Qty.	Price	Amount

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Mail order to: 4952 Whitefish Stage Rd. Whitefish, MT 59937

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Shipping _____

TOTAL _____

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2007 PRICE LIST & ORDER FORM

Voler Cycling Clothing

Short Sleeve Jersey w/pocket	\$34.95	xs-2xl
Womens Short Sleeve Jersey w/pocket	\$34.95	s-xl
Sleeveless Jersey w/pocket	\$34.95	s-2xl
Long Sleeve Jersey w/pocket	\$49.95	xs-2xl
Long Sleeve Summer Weight Jersey	\$49.95	s-2xl
Wind Vest	\$44.95	s-xl
Wind Jacket	\$59.95	s-xl
Thermal Vest w/pocket	\$59.95	s-xl
Thermal Jacket w/pocket	\$89.95	s-xl
Cycling Shorts	\$39.95	xs-2xl
Womens Cycling Shorts	\$39.95	s-xl
Cycling Bibs	\$44.95	s-xl
Cycling Skinsuit w/pocket	\$79.95	s-xl
Arm Warmers	\$29.95	s-xl
Giordana Winter Cycling Gloves	\$34.95	s-2xl
Giordana Cycling Gloves	\$19.95	s-2xl
Hammer Socks	\$4.95	White/Black s-xl

Pretty in Pink Cycling Clothing

Short Sleeve Jersey w/pocket	\$34.95	s-xl
Wind Jacket	\$59.95	s-xl
Cycling Shorts	\$39.95	s-xl
Arm Warmers	\$29.95	s-l
Socks	\$4.95	s-xl
Giordana Cycling Gloves	\$19.95	s-xl

Voler Tri Clothing

Mens Tri Top w/pocket	\$39.95	s-xl
Mens Tri Short	\$34.95	s-xl
Mens Tri Skinsuit w/pocket	\$69.95	s-xl
Womens Tri Shimmel w/pocket	\$29.95	s-xl
Womens Tri Short	\$34.95	s-xl
Womens Tri Skinsuit w/pocket	\$69.95	s-xl
Womens Sport Top	\$19.95	s-l

Multi Sport/Running Gear

Singlet	\$19.95	White	s-xl
Trail Shirt w/pocket	\$19.95	White	s-xl
Cool-T	\$19.95	White	xs-xl
Mens Running Shorts w/pocket	\$29.95	Grey	s-xl
Mens Running Shorts w/pocket	\$29.95	Red	s-xl
Womens Running Shorts w/pocket	\$29.95	Grey	s-l
Womens Running Shorts w/pocket	\$29.95	Red	s-l

Patagonia

Mens Capilene 1 T-Shirt	\$36.00	White	s-xl
Mens Capilene 1 Crew	\$38.00	White	s-xl
Mens Capilene 2 Tank	\$30.00	White	s-xl
Mens Strider T-Shirt	\$40.00	White	s-xl
Mens Vitaliti Pique Polo	\$55.00	Blackberry	s-xl
Womens Capilene 1 T-Shirt	\$36.00	White	s-xl
Womens Capilene 1 Tank	\$32.00	White	s-xl
Womens Strider T-Shirt	\$40.00	White	s-l

Headwear

Euro Style Cycling Cap	\$8.95	Red	os
Mesh Race Ready Cap	\$12.50	White	os
Ventilator Hat	\$14.95	Red	os
Winter Beanie	\$17.95	Black	os
Halo Headband	\$12.95	Black/White/Blue	os
Halo Headband II	\$12.95	Black/White/Blue	os
Halo Protex	\$21.95	Black/White/Red	os
Halo Anti-Freeze	\$16.95	Black	os
Flex-Fit Baseball Caps	\$14.95	Black	s/m-l/xl
Watch Cap	\$8.95	Black	os

Casual Wear

Short Sleeve Tee	\$9.95	Red/Chestnut	s-2xl
Youth Short Sleeve Tee	\$9.95	Red	xs-m
Long Sleeve Tee	\$12.95	Red	s-2xl
20th Anniversary Tee	\$12.95	Slate	s-2xl
Organic Cotton Retro Tee	\$12.95	Natural	s-2xl
Women's Tee	\$12.95	White/Blue	s-xl
Hooded Sweatshirt	\$29.95	Grey	s-xl

Accessories

Hammer Gel Flask	\$1.50	
Double Clip Flask Holder	\$7.50	
Bike Mount Flask Holder	\$12.95	
Large Water Bottle	\$2.50	24oz.
Small Water Bottle	\$2.50	21oz.
Pink Water Bottle	\$2.50	24oz.
Recoverite Shaker	\$4.95	25oz.
Gel-Bot Fuel System	\$15.95	24oz.
Gel-Bot Soft Flask	\$10.95	5.5oz.
Quick Coin	\$0.75	
Tattoo	\$0.25	
Hammer Gel Decal	\$0.50	
30x60 Hammer Gel Banner	\$20.00	
5-Gallon HEED Cooler	\$29.95	
Hammer Pint Glass	\$4.50	16oz.

53x11 Coffee

The Big Ring	\$11.95		12oz.
The Early Break	\$11.95		12oz.
The Chain Breaker	\$11.95		12oz.
53x11 T-Shirt	\$18.00	Natural	s-xl
Coffee Mug	\$9.95	Black/Yellow	15oz.

Bookstore

Guide To Success Handbook	\$1.99
Treat Your Own Neck	\$9.95
Treat Your Own Back	\$10.95
Sugar Blues	\$6.99
Food Is Your Best Medicine	\$6.99
Water : The Shocking Truth	\$8.95
Healing Back Pain	\$13.99
Endurance Nutrition DVD	\$29.95

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Triathlon One O One

Hammer Nutrition partnership



Steve Born

The number of events we sponsor continues to grow and every week it seems like we're adding new events to the list. The newest to join the ranks of Hammer Nutrition sponsored races is the Triathlon One O One series and, needless to say, we're extremely excited to be a part of what are sure to be outstanding events. Hammer Nutrition is the official energy gel and energy bar of Triathlon One O One, and we'll also be supplying Endurolytes for the race.

Triathlon One O One is under the leadership and direction of Shannon Kurek, who is also the executive director of HRP Racing, whose races Hammer Nutrition has enthusiastically sponsored for many years. What makes Triathlon One O One unique (and it's what its name stands for) is the race distance. Triathlon One O One races will feature a 1.86mi (3km) swim, followed by a 80.6mi (130km) bike and finishing with a 18.6mi (30km) run - a total distance of 101.06 miles.

Here's the race schedule and some information about each race, courtesy of the Triathlon One O One web site (www.trioneoone.com) -

5/6/2007: Bradenton One O One Race Day: Triathlon One O One kicks off the season in beautiful Bradenton, Florida. Welcome to Florida's Gulf Islands of Anna Maria Island & Longboat Key and the Bradenton Area.

6/10/2007: ClearLake One O One Race Day: Triathlon One O One visits Clear Lake, California in June, located in Northern California, approximately 90 minutes from Sacramento, the Bay

Area, or the Pacific Coast, and about an hour north of Napa Valley.

9/2/2007: Halifax One O One Race Day: Triathlon One O One goes north to Canada's Atlantic Coast to Halifax, Nova Scotia - one of the world's perfect places. With over 400 km of dramatic coastline, white sand beaches, and one of the world's largest natural harbours, its no wonder life here revolves around the sea.

11/11/2007: The Woodlands One O One Race Day: As they say "everything is bigger in Texas" - and the 2007 Triathlon One O One season finale will be no different as we culminate in The Woodlands just north of Houston and feature a \$150,000 professional prize purse and an anticipated age group field of 2000.

According to Shannon, "The series will start expanding in 2008 to a total of 20 events worldwide by 2010. Each Triathlon One O One event will feature a \$50,000 professional prize purse and the Triathlon One O One Championship will feature a \$150,000 professional prize purse."

Additional features of the Triathlon One O One races:

- Live race day coverage provided by Slowtwitch.com.
- Live real-time race results.
- Technical t-shirt and race visor in registration packet.
- Huge finisher medal with custom ribbon.
- A family kids zone with kid specific entertainment.
- Impressive finish line with knowledgeable race announcers.
- World class staging area.
- Locally and uniquely designed finisher t-shirt.
- Value added pre-race dinners priced right for the entire family.
- Supportive and embracing communities.
- Well-staffed and trained volunteers throughout the event.
- Large non-sponsor specific pre-race expo.

More information about Triathlon One O One, as well as our involvement in these great races, can be found at www.trioneoone.com.

HOT TIPS

Lose those last few pounds of fat

So, the racing season is almost here and you're getting pretty fit... with the exception of those last few stubborn pounds that just don't seem to want to leave. How do you shed those remaining "hard-headed" pounds without compromising your training? It's as simple as cutting starch out of your evening meal and replacing it with copious amounts of vegetables and salad. Eat normally throughout the day, then for your evening meal, just consume protein, salad and vegetables. The vegetables will provide all of the carbs you need to maintain glycogen stores. You may feel a little hungry before bed, but do this regularly (not necessarily every day) and watch those love handles evaporate.



Oliver Medzihradsky : A mountain top experience

Hello,

I just wanted to convey to you my excellent experience using Perpetuem as my primary fuel on an expedition to summit Aconcagua (22,841 ft) in Argentina in February of this winter!

With approximately 6-8 hours of climbing per day, and unusually high wind speeds and high snow volumes this season forcing many teams to turn back due to those factors and to exposure as well as fatigue factors, my team grew progressively pessimistic as we ascended. Luckily, four of the ten of us were able to secure a summit day bid and reach the top; I am convinced that it was due to consuming 2L of Perpetuem per day that I felt 100% from cardiovascular and energy reserve

standpoints as I reached the summit. My other teammates were continually curious about the compound I was using as my primary fluid fuel, and several of them wrote the product name down for possible future endeavors like this.

The experience on Aconcagua this winter has confirmed my selection of Perpetuem as the fuel of choice for my longer training sessions, and I plan on using this experience to solidify the ongoing training program for my first ironman distance tri in 2008.

Thanks for a great product!
Oliver Medzihradsky

Lincoln Murdoch : Cruising right along

Just wanted to say thanks for your great products. Using HEED, Hammer Gel and ATP, I hammered out the fastest bike split of the race on my Valdora PHX and with a solid nutrition plan took 1st Overall in the Lake Havasu Sprint Tri. Your company is the best nutritional company on the planet. I proudly wore Hammer casual and race clothes before, during and after the race. I hung the Hammer towel in the transition area next to my bike.

Thanks again for all you do to help us endurance athletes to achieve our goals. You guys ROCK.!

Lincoln Murdoch

Stephen McDonald : Reclining but not relaxing



I've been a user of Hammer products for three years now and have passed the word to many other new clients for you.

Recently, I finished second in the 1000 meter sprint in the HPRA races on March 11, 2007 on the Velodrome Track at Brian Piccolo park in South Florida. I used Hammer Gel before the race and it definitely made the difference.

While I know your products are for endurance, it can also be used very effectively for sprinting events. Also note that this event is for recumbent riders. Great Product!

Stephen McDonald





Reba Hoffman : 5 at 50

I am a cancer survivor and it is essential for me to only consume healthy products. I have grown to completely trust the Hammer Nutrition staff as well as your products. My own research confirms your products are solid.

In June I'll be turning 50. My plan for several years has been to run 5 marathons in my 50th year. I live and train in Florida year round. I run and cycle through heat, humidity and hurricanes. I have also been functionally hypoglycemic for 20 years. I don't have the issue when I'm not training but would crash after the 4 hour mark.

Once I fainted on my bike on a morning in July. This resulted in a concussion, dislocated shoulder and broken collar bone, all because I expended everything I had and the other sports drink I was drinking was not being absorbed. I hit empty....and the pavement!

One of the marathons I'm planning is the Two Bear. I hope to meet all of you while in Whitefish. What a way to celebrate Hammer's 20th anniversary and my 5 at 50!!!

Reba J. Hoffman

Carl Leonard : Fueling right and feeling great Down Under

Just letting you know that I had a fantastic day at Ironman with a 9:57 and gaining a spot to Kona!

I had zero nutrition issues all day and this is SO far removed from my previous debacles that I just wanted to express my sincere thanks – particularly for the ongoing advice

from Steve - that has allowed me to put together a nutrition plan that WORKS!!!!

I cannot provide a higher endorsement of the products than that and again I am extremely grateful.

Carl Leonard, New South Wales

Congratulations Steve - You'll receive a one month supply of Endurolytes for your story

Steve Seal : Marathons - 7, Cramps - 0

As with many guys in their mid to late 40's, in 2002 my friend and I decided to run a marathon. We picked the Marine Corps marathon and living in central Georgia began training over five months in advance of the marathon.

We experienced severe leg cramps in the last 4-6 miles. Not to be deterred, we signed up for another marathon (the Blue Angel marathon in Pensacola) and again the cramps were a problem. After our third marathon with leg cramp problems, we decided to use the Endurolytes we were given in our race packets for the Blue Angel event to see if we could get a handle on the electrolyte

problem. Most of our Saturday long runs (10-18 miles) occur in a hot, humid climate in Georgia, even with 6 AM starts. We started noticing that the cramps were no longer a problem. Now, a couple of years later, my personal marathon record for cramping is 0-3 (first three marathons) without Endurolytes, and 7-0 with Endurolytes. Needless to say I am sold out to the use of Endurolytes for training and all distances event running. I have been able to "sell" several runners on the virtues of Endurolytes and have had no one use them and tell me they did not work.

Steve Seal
52 year old runner in Georgia

WIN FREE PRODUCT!

Have our products made a difference for you? Tell us how, and if we choose your story to print in our next newsletter, we'll send you a one month supply of one of the products you write about. To enter, e-mail us at anock@hammernutrition.com and put 'FREE PRODUCT SUBMISSION' in the subject line. Thanks!

Amelia Tanner : Going after the big girls

Millie attended the Lance Armstrong Junior Olympic Race yesterday. She competed against 7 other riders, all of which were 11-12 years old. Millie, being only 9, took 3rd place. She stated that she owes it to Hammer for keeping her fueled up before the race, and the HEED kept her conditioned and with high performance during the race. I have attached some pictures for you, and I hope you enjoy them. Check out the logo on the calf of the last picture!

Jet Tanner





Byron Lane : Following in the the footsteps of his hero

I know your products make a difference. My winter training had been going well and I was optimistic about repeating last year's double: winning two 50k runs in January. Despite a scheduling change that moved the races only one week apart, things started off smoothly with a win in race #1 and a great recovery (Thank you, Recoverite!) following. Halfway through the second race, I've been steadily losing ground to the leader, now just over four minutes ahead. At an aid station, I ask about the mystery runner ahead of me. They tell me that he's run two 2:24 marathons and is the course record holder.

I decide that since he probably won't come back to me, I had better push the issue, and decide to attack. Out

comes the coin purse, down go two Endurolytes, another squeeze of Sustained Energy, and I steel myself for a long, drawn-out battle. I push the next 20k of the pebble-embedded course in 1:24, catching the other runner with five miles to go. I notice that he is empty-handed. I smile, thinking that this is too much work to do without constantly replenishing the body. Half a mile later I am clear, and go on to win. Five minutes after I cross the line, he's still not back. Struggling, he finally makes it in, and the first thing he asks is if I always carry a drink while I race. I smile, and like my running hero, Emil Zatopek, would have done, I sit down, and begin to tell him my secrets.

Byron Lane

James Lee : Getting it done on one wheel

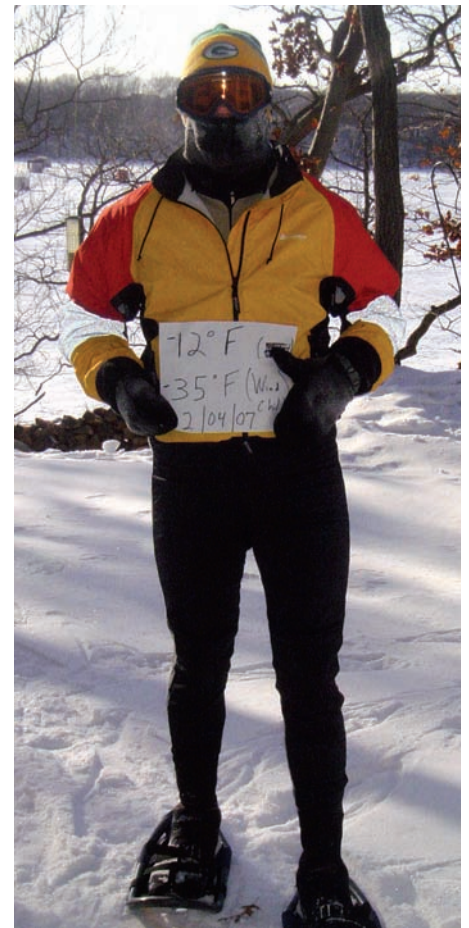
Last year I was the first person to attempt the 12 Miles of Hell MTB event in Lawton, OK on a unicycle (Muni). But since it was a last minute decision (some MTB riders told me it would be impossible) I was not properly prepared. The only thing I took was water, and the course that year was 15.5 miles.

The 4 hour plus effort left me completely drained and the sport drinks and bananas at the finish were too little too late and I later experienced the worst cramps of my life.

This year on March 4th, I was far better prepared and had a bottle of Perpetuem before the start, carried a

gel flask and Endurolytes (which I shared with cramped riders along the trail), and had a bottle of Sustained Energy in my pack. Though the 17.5 ride took me over 4:47, I was not exhausted and experienced no cramping. I did not push for time this year since the ride was more a training ride for the upcoming Moab MUni Fest on March 24, 25th which is coincidentally sponsored by Hammer Nutrition. I will be there sharing my experience with your products to other riders. Thanks for sponsoring our growing sport!

James Lee



Jeff Vandenbusch braves the very, very cold Minnesota winter to get a little snowshoeing in.





Pete Schultz : Welcome to the family!

Just wanted to let you know how much I appreciate your company. Your Endurolytes, HEED, and Hammer Gel (which I got as samples from another event) are literally responsible for my 3rd place finish in my first half iron-man. I also just ordered a bottle of Endurolytes and it arrived days before I was supposed to get it! I am 22 years old and will be a customer for life.

Pete Schultz



Mike Tierney sets a record on Slickrock Trail during the Hammer sponsored Moab MUni Fest.



Eric Herdman wrote to tell us, and show us, his 4-year old son Caden got into the Hammer tattoos. He's looking pretty ferocious with that tat!

Randy Profeta : Improving his vision (Quest)

Each year in early March, a local trail advocacy group called the Warriors' Society hosts an event called the Vision Quest here in the mountains of Orange County CA. It is a 57+ mile MTB endurance event with about 12,000 feet of climbing. There are three separate stages, each with cutoff times, so mere mortals like me have to push pretty hard to get in under the wire.

I did my first VQ in 2004 on my geared bike and finished in 8:58. I did the 2005 and 2006 races on my singlespeed and finished both attempts. In 2005, they added five miles to the event, so finishing times increased proportionally. Last year I finished in 9:03. My goal this year was to beat my 2006 time by 15 minutes.

My 24-hour race experience has taught me that you can save lots of time by managing/minimizing your stops, so this year, I decided to go unsupported, carrying most of my water/nutritional needs in my CamelBak. I planned to stop only once before the final stage to refill my hydration pack with HEED and H2O. I had two multi-hour SE bottles, Endurolytes, Anti-Fatigue caps, and ATP on board.

The strategy paid off. I went through

the first control with 90 minutes to spare. Same for checkpoint #2. I got into #3 with 1:10 to spare. The first two stages combined are about 45 miles long with a total of about 8,500 feet of climbing with some nice technical singletrack to keep you focused. Stage three is the king of all hike-a-bikes up a local trail called West Horsethief. It gains 1,200 feet in about 1.1 miles. Picture walking up to the top of the Empire State Building pushing/carrying your bike after running the NY Marathon and you'll have a sense of what it's like.

The net result: I shaved off 43 minutes from last year's time, finishing in 8:20 on the singlespeed, even with a minor delay to adjust a loose headset. I'm still waiting for the final results to come in to see whether I won my age group. Not only a personal best for me on the single speed, but I beat my time on the geared bike which was run on a shorter course.

Thanks again, Hammer Nutrition, for helping me to realize another of my goals. And thanks to all of the Endurance List contributors for all of your great recommendations!

Randy Profeta

Tom Liebl : Hammer Gel boy

I have been a sponsored athlete for a few years (and hopefully will continue that partnership) and I wanted to relay a little "story". It was more than 10 years ago that I got into mountain biking and at that time was using Gu (only thing around). I was flipping through a Velo News issue and in the back was this tiny add offering a product called Hammer Gel. I ordered a couple bottles because the price was right. I fell in love with the product and was quick to tell my cycling buddies (which were few). They developed the same love of the product and the four of us started racing and have been proud sponsored athletes of the Hammer Gel team.

Now, since over 10 years have passed, I was sitting on my trainer in a spin class and noticed something. In

the room with 40 athletes, the number of Hammer Gel jerseys, the Hammer water bottles, the banners, and the bottles of Hammer products next to the trainers were commonplace. I was the first to use the product in a town of 80,000 and now it has grown like wild fire. Large numbers of athletes using the product, one pharmacy carrying the product, the major cycle shop in town carrying the product-----what an awesome feeling. I love when other cyclists refer to me as one of those "Hammer Gel Boys".

Thanks for your help in allowing me to get the most out of this 47 year old body with your products and helping the sport of endurance racing grow.

Tom Liebl
(Team Cycle Hawks)



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Energy Surge
 - Athlete Spotlight
Reid & Michele Delman
 - Common Questions
Perpetuem & Sustained Energy
 - Glutamine
A vital post-training nutrient
 - Start Your Season Right
Coach Al tells you how to do it
- ...and so much more



**Join us for the 2007
Highline Hammer!**

Details on page 32

2006 Highline participants / Photo - Angela Nock

HOT TIPS

Take your supplements with grapefruits or grapefruit juice

Courtesy of Dr. Bill: I know of no reason why to limit grapefruit juice from use with any Hammer Nutrition supplements. Here is why: Grapefruit juice increases the absorption, bioavailability, and potency of nutrients due to the bergamottin content of grapefruit temporarily blocking some types of Cytochrome P-450 enzymes (especially CYP3A4 enzyme) in the gastrointestinal tract. Like all Cytochrome P-450 enzymes, CYP3A4 is responsible for the (phase I) detoxification of various substances in the intestines and liver. This inhibitory effect of Grapefruit juice may last for up to 48 hours after ingestion. Docosahexaenoic Acid (DHA), Piperine, and Vitamin B3 (Niacinamide form) also inhibit the CYP3A4 enzyme.

CONCLUSION: In my opinion, the effect of grapefruit or grapefruit juice is positive, favoring nutrient-potency effects in human metabolism.

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