



endurance

NEWS

a newsletter for the endurance athlete

issue
40

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Clean Water!

Reverse Osmosis vs. Distilled

by Bill Misner, Ph.D

A client recently emailed me and said, "I know you recommend Distilled water. How do you compare it to Reverse-Osmosis (RO)? Do you know of any quality Distiller manufacturers that you would recommend? Or RO manufacturers?"

I replied by saying that I do not recommend RO after spending over eight months researching water treatment devices, six of which were highly detailed, meticulous, and productive. I objectively concluded that the "Pure Water" Distillation units were the best performing unit for purifying water, reducing the parts per million from 550ppm to between 2 ppm. Since 1996, I have used the Pure Water home model, distilling to date exactly 1136 gallons (I keep a running count.)

A competitor of the Pure Water distillers challenged me to test the quality of the water

being produced by my small portable model. She could not believe her eyes when her test was only 2 PPM; she said she had never seen water that pure in all the tests performed.

RO is "fair" if you don't mind the maintenance caring for the constantly clogging active filter unit, which can also harbor microbes. Here follows some of the basic comparisons between the two units. Incidentally in the early 1990's Michael Colgan also completed similar water treatment research for athletes attending the Colgan Institutes in San Diego. Dr. Colgan concluded exactly as I did that the Pure Water distillers did the best job of all current models.

Distilled Water & Reverse Osmosis (RO) Compared

Water distillation with carbon filtration reduces toxic contaminants 99.9% or from 550
(see WATER on page 3)

Complex Carbs vs. Simple Sugars

by Bill Misner, Ph.D & Steve Born

As you know, we have long advocated the use of complex carbohydrates over simple sugars. Still, there are a plethora of simple-sugar based sports drinks available to athletes. In addition, there are a lot of so-called experts who are supplying incorrect information to athletes regarding carbohydrate intake. Needless to say, it can be quite confusing for athletes! With that in mind, we present the evidence that favors long-chain carbohydrates (complex carbs - maltodextrins, glucose polymers) over short-chain carbohydrates (simple sugars - glucose, sucrose, dextrose, fructose, galactose).

Q: I'm a happy customer (hammer gel and sustained energy) who just had a conversation with a coach ... he doesn't believe that we can absorb CHO solutions greater than 8%.

Can you point me toward some independent

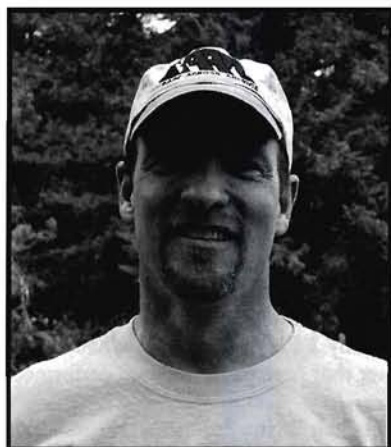
research that proves we can absorb much higher concentrations of large molecule carbs? Personally, I believe it, but my friend would like some proof.

A: Your colleague is correct if he is referring to short-chain carbohydrates, simple sugars, which are absorbed between 6-8% solutions due to osmolar pressure generated by solution. However, long chain carbohydrates are absorbed immediately in 15-20% solutions. Maltodextrin is an example long chains of simple sugars linked together, and when in as high as 15-20% solutions they are absorbed due to their osmolality of 280-303 mOsm, which duplicates transient body fluids osmolality. If you separate maltodextrins linked simple sugars, they must be diluted to 6-8% in order to achieve an acceptable absorption osmolar value of body fluids @ 280-303

(see CARBS on page 4)

UltraCycling Hall of Fame

by John Hughes • Ultra Marathon Cycling Director



Steve Born - 2003 Inductee

Steve Born, 44, from Whitefish, MT will be inducted into the UltraCycling Hall of Fame at El Tour de Tucson in November and will also be honored at the Competitor magazine banquet in February.

Born has been involved with ultracycling for 15 years. He has competed in five RAAMs, holds two UMCA records, is the 1994 Furnace Creek 508 Champion, the 1999 Furnace Creek 508 runner-up, and in 2002 became the first and only cyclist to complete a double Furnace Creek 508.

Born exemplifies the ultracyclist - in addition to a stellar racing career, he has crewed in seven RAAMs and three Furnace Creek 508s, and has officiated in two RAAMs and several RAAM qualifiers. Born has ridden in several PAC Tours, Pacific Crest Tours, and Red Rocks Tours.

He also supports the sport with his wealth of knowledge about nutrition, working with and providing advice to many riders, including several RAAM riders. Professionally he supports a large number of ultra cycling races throughout the U.S. via his employment with the E-CAPS/Hammer Nutrition company.

Born has been a member of the UMCA for over a decade and currently serves on the Board of Directors of the UMCA, Inc.

Born's Palmares

1987 RAAM Open West
35h 37m

1988 RAAM
10d 20h 58m

1991 RAAM
10d 06h 30m

1994 Furnace Creek 508
31h 09m, first place

1997 Idaho N-S Record
640.8 miles in 39h 29m

1998 RAAM
9d 17h 48m

1999 Texas W-E Record
574 miles in 32h 20m

1999 Furnace Creek 508
30h 57m, second place

2002 Double Furnace Creek 508
82h 16m

Our Mission

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

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

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

Brian Frank
CEO

Back issues of Endurance News are available online at: www.e-caps.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.

We all know that we need to eat right and be healthy, but sometimes it simply is not convenient. The Organic Vegan Food Bar solves that problem - and it tastes great too!

**Live Food For A Live Body And
A Sound Mind**



\$2.50
ea.

12 or more

\$2.25
ea.

(WATER from page 1)

parts per million to as low as 2 parts per million. The highest quality carbon block filtration system reduces toxins from 550 ppm. to 25 ppm. Reverse Osmosis (RO), on the average, reduces incoming tap water of 550 ppm contaminants to as low as 50 or as high as 150 ppm. RO units produce an inferior product and may with time introduce microorganisms if the membrane is not replaced during regular intervals. Reverse Osmosis (RO) units reduce a wide range of minerals and heavy metals, but are not as effective at removing pesticides, herbicides, and some chemicals. They are very low-performing units for removing volatile Organic chemicals. RO units are inefficient, producing 1 gallon for every 3 to 6 that run through the unit. The maximum output for the RO is 5 gallons every 24 hours. Home water pressure is often too low to make the RO as effective as it was designed to be while membrane replacement is not only a constant repair bill, it has been reported to me that bacteria, virus, giardia cysts, and parasites congregate and accumulate during the lifespan of the RO-membrane.

NSF-Certified under Standard #58 RO-

Units do NOT compare favorably in terms of water product and contaminant removal with the distilled units(below):

	DISTILLED	RO
ORGANIC	99.9%	75%
Pesticides		
Insecticides		
Herbicides		
Solvents		
INORGANIC	90-99.9%	68-90%
Chlorine		
Asbestos		
Selenium		
Mercury		
Arsenic		
Barium		
Nitrates		
Copper		
Lead		
RADIOACTIVE	96%	66%
Strontium		
Plutonium		
Radium		

	DISTILLED	RO
BIOLOGICAL	100%	70%
Bacteria		
Viruses		
Giardia		
Parasites		
Protozoa		

When comparison of the end-product result is so defining, Reverse Osmosis is clearly inferior to Distilled Water. My personal preference for distilled water is mildly tainted from having processed and consumed 761 gallons via a 5-year old MD-4 Pure Water Distiller which has an external mounted carbon filter. Both my wife and myself will drink nothing else. In fact we ran low due to Master's Nationals in Spokane recently and had to purchase grocery store distilled water. My wife said it did not taste right and would only drink the freshly distilled water from our home distiller.

DISCLOSURE STATEMENT: I am an employee of E-CAPS Inc, a distributor of Pure Water Distillers, however, my pay is not remuneratively related to sales of this product.

For the convenience of our customers plus enthusiasm seeing the Pure Water Distiller, Brian Frank continues to maintain a distributorship for clients.

CLOTHING BLOWOUT!!

Stock Up Now On Winter Clothing....Save Money On Tri Clothing

Fall & Winter Clothing

You can look oh-so cool - without the discomfort of being cold - during the autumn and winter months. Did you know that we sell some absolutely terrific cold weather gear? It's true! Voler makes some awesome clothing and we have it in stock. Here are the particulars...

Long Sleeve Jersey -

Warm and highly moisture-wicking, it has a full length zipper and 3 rear pockets.

Thermal Vest -

Made from Windtex, a windproof and waterproof fabric it features a dual directional zipper, high collar, and 3 rear pockets.

Winter Thermal Jacket -

This jacket will keep you warm and dry. Made from Windtex, a windproof and waterproof fabric, it features a dual directional zipper, 3 rear pockets, and a high collar to keep the chill out.

Wind Jacket -

Made from Vortex RipStop microfiber construction this jacket is wind and water resistant.

Features ventilated mesh side panels, underarm vents, high collar and a double-pull zipper.

Wind Vest -

Made from the same fabric as the Wind Jacket, this vest also features ventilated mesh side panels, underarm vents, a high collar and a double-pull zipper.

From wind vests and windbreakers to thermal vests and jackets Voler's quality (and our very stylish graphics) are the ticket for comfort and style during your cold weather training. Check 'em out now on our web site or ask for your free copy of our soft goods catalog.

Tri Clothing Blowout Sale!

During the month of November all of our fantastic Voler Tri Clothing will be on sale. Add it to your Christmas Wish List or buy it for someone you know. It will make a great gift for that multi-sport athlete.

Mens Tri Top -

Made from Ventana Micro Mesh (a poly/lycra micro mesh) the top features an 18" hidden zipper and wide arm holes. \$34.50

Mens Tri Short -

7" inseam and a seamless, fast drying, Bio Air II Chamois that conforms to body to keep you comfortable. \$28.00

Mens Tri Skinsuit -

The same lightweight, quick-dry chamois as the shorts, the skinsuit also has a 3/4 hidden zipper and wide, sleeveless arms to prevent chafing. \$62.50

Womens Shimmel -

Shelf bra that provides medium support. Shimmel also has 3 rear pockets. \$26.50

Womens Tri Short -

Features seamless Bio Air II Chamois that conforms to body and is fast drying to keep you comfortable. \$28.00

Womens Tri Skinsuit -

The same lightweight, quick-dry chamois as the shorts, the skinsuit also has a 3/4 hidden zipper and wide, sleeveless arms to prevent chafing. \$61.00

(CARBS from page 1)

mOsm. If the osmolality value of a carbohydrate solution is above normal body fluid levels of 280-303 mOsm, the gut must draw both fluids and electrolytes (namely sodium) in order to reduce the osmolar values down to body fluid levels of 280-303 mOsm. There is myriad of research that establishes the given necessity for osmolality of a solution required for absorption.

This is basic research from Weber & Ehrlein, Glucose and maltodextrin in enteral diets have different effects on jejunal absorption of nutrients, sodium and water and on flow rate in mini pigs. Dtsch Tierarztl Wochenschr. 1998 Dec;105(12):446-9:

"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."

DR BILL'S NOTE:

The balance between electrolyte flux, fluid volume and the length of carbohydrate chains determines what solution will be receptively absorbed immediately. This report is a "given" from widely accepted, concluded basic science.

Here's another study and reference:

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 during 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.]

Q: I recently read a triathlon newsletter that suggested that monosaccharides & disaccharides are digested more rapidly as compared to maltodextrins. Is there any research to prove this?

A: Actually, the studies below show the opposite to be true. Remember, if a mono- or disaccharide carbohydrate is consumed in a 6-8% solution than yes, it will pass the gastric channels very efficiently. However, so too does a complex carb AND it can do that at a 15-18% solution (which will of course provide more calories). This is a clear indication that complex carbs are ALWAYS superior to one or two chain carbs.

Glucose Polymers [Maltodextrins] Empty 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 min-

imal 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 [the 22% complex carbohydrate solution], although it has the propensity to form a gel, empties from the stomach faster than that of an isoenergetic carbohydrate solution (G-drink, the simple sugar solution) 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. Scand J Gastroenterol 2000 Nov;35(11):1143-9.

Body Fluid Osmolality Caloric Values Of Sugar And Long Chain Carbohydrates (Gastric Transit Rates Favor Maltodextrin During Exercise)

Fuel Type	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

(see CARBS on page 5)

(CARBS from page 4)

Gastric emptying rates are affected by stomach volumes ranging from 400 ml. to 800 ml. [13-26 fluid oz.]. Some athletes tolerate significantly higher stomach volumes than do others. As noted here, one athlete tolerated 50% stomach volume of the other. In a 10-minute period of time, athletes were observed to empty stomach volumes at the following rates:

1-Pure Water Solution 65%

[From 400 ml., 260 ml. was emptied
From 800 ml., 520 ml. emptied]

2-Isotonic 7% Carbohydrate Solution-50%

[From 400 ml., 200 ml. was emptied
From 800 ml., 400 ml. emptied]

3-Glucose 15% Solution-25%

[From 400 ml., 100 ml. was emptied
From 800 ml., 200 ml. emptied]

4-MALTODEXTRIN 18% Solution-25%

[From 400 ml., 100 ml. was emptied
From 800 ml., 200 ml. emptied]

REFERENCES:

Gastric emptying with repeated drinking during running and bicycling. Rebrer NJ, Brouns F, Beckers EJ, ten Hoor F, Saris WH Int J Sports Med 1990 Jun 11:3 238-43.

Faster gastric emptying for glucose-polymer and fructose solutions than for glucose in humans. Sole CC, Noakes TD, Eur J Appl Physiol 1989 58:6 605-12.

High rates of exogenous carbohydrate oxidation from starch ingested during prolonged exercise, Hawley JA, Dennis SC, Laidler BJ, Bosch AN, Noakes TD, Brouns F, J Appl Physiol 1991 Nov 71:5 1801-6.

OUR CONCLUSIONS AND RECOMMENDATIONS:

A 6-8% solution of any of a simple-sugar sports drink may arguably be ideal for maintaining hydration but it will not satisfy energy requirements. At a 6-8% solution these drinks will only provide about 100 calories an hour, which is inadequate for maintaining energy production. The inherent problem with these simple sugar drinks is that they **MUST** be mixed at that weak 6-8% concentration in order to match body fluid osmolality parameters and be digested with any efficiency. Again, simple sugar can cross gastric membranes only in a 6-8% solution.

Once that 6-8% simple sugar solution concentrate is increased (or if it is consumed with or near a complex carbohydrate product) so too is osmolality and, unless more water and electrolytes are added to the mix (at which point you might very well be flirting with over hydration), it will not cross gastric membranes. Even more problematic is that if you don't add more fluids and electrolytes the body will recruit these from other areas in the

body (areas that critically need these fluids and electrolytes) and divert them to the digestive system to aid in the digestion of this too-concentrated mix.

Additionally, we all have seen how blood sugar curves are elevated parallel initially (that very noticeable energy "Spike"); however simple sugar curves appear to pose a below fasting baseline "Crash" mysteriously absent in the longer chain carbohydrates. In other words, you can avoid that "flash and crash" experience in your energy levels by avoiding simple sugar drinks and gels and by using complex carbohydrates.

Unless you want to present the body with some very potential problems, not the least of which is stomach distress, a simple sugar drink or gel has to be consumed at weak concentrations. Remember, if you choose to use these types of energy fuels don't forget that compared to complex carbohydrates they cannot provide adequate amounts of calories for energy production. The choice is yours: Either 70-100 calories from simple sugar to be available for energy production (which we all know as being inadequate) or up to three times that amount to be available from complex carbs.

Our recommendation is to use complex carbohydrates products - Hammer Gel, Sustained Energy, and Perpetuem - and to avoid simple sugars for:

- More efficient digestion
- More substantial and adequate amounts of calories for energy production
- More stable energy levels, with a much more gradual decline in blood sugar levels (and never below fasting levels)

Retailer Update

It's an exciting time of growth and expansion here at Hammer Nutrition central. One of the most recent expansions includes the addition of 57 Running Room stores in Canada that will now be carrying our products.

As always, if your local retailer does not carry Hammer Nutrition, ask why and have them get a hold of us. Also if your local REI isn't carrying our products, talk to the manager and they'll be sure stock up.

Our New Website e-caps.com Gets A Face-Lift

We invite you to come visit our new web site at <http://www.e-caps.com>. New information has been added including our Team E-CAPS re-supply program and a 3-step Getting Started section to assist our clients through the many choices. We brought forward some important benefits such as our Tell a Friend referral discount and what our clients have to say about our products.

The focus for the new web site is to provide a quick, easy path for you to access E-CAPS and Hammer Nutrition products as well as the many free articles and download resources. You can get in and get out with your shopping basket full, if you know what you're looking for, or just spend time exploring new product offerings and nutrition articles.

Please note: If you are currently using or have bookmarked www.hammergel.com or www.hammernutrition.com to get to our web site, please change this to www.e-caps.com. We will be developing a site specific for our storefront dealers distributing Hammer Nutrition products. This future site will be a product information-only site.

Also, while you're surfing our site if you find any broken links or non-functioning areas just e-mail us and we will give you a free jug of Hammer Gel, you choose the flavor.

We built this site for you, our valued client. We hope you enjoy the experience.

Misc. Changes

We've made some changes in our shipping charges that will hopefully serve you better. Effective November 1, there will no longer be a surcharge for the heavier items such as Sustained Energy, Perpetuem, Hammer Gel and so on. Cheapest way shipping rates have also changed and will be as follows.

Cheapest Way Shipping Rates

Order Amount	Shipping
\$0 to \$49	\$7
\$50 to \$99	\$8
\$100 to \$149	\$9
\$150 to \$199	\$10
\$200+	FREE

Another change that is effective immediately deals with the Fueling Handbook. If you've never received a copy, the first one is still free. All subsequent copies are \$2 each. The Fueling Handbook is still available for FREE by downloading it off the website at www.e-caps.com

The BreakAway Spirit *by Tony Schiller*

Have you ever had a transformational race? I don't mean a breakthrough performance but a race experience that made you stop and think differently about why you race and how you live. That happened to me during my first Hawaii Ironman experience in 1989. It had been a breakthrough year for me with a dozen top 5 performances on the professional circuit. All that was left to top the year was a top finish in Hawaii.

That also happened to be the year that ABC introduced the world to the amazing father and son team of Dick and Rick Hoyt. If you were lucky enough to see the broadcast you'll never forget it. As a competitor in the race, I was impacted by them in a much more personal way that has forever changed my life.

As you'll recall, with a rope tied around his waist to a rubber raft, Dick pulled his quadriplegic son through the entire 2.4 mile ocean swim, then he balanced Rick on the front of an oversized mountain bike for 112 miles, then if that wasn't enough, he ran the final 26.2 mile marathon pushing his son in a wheelchair.

But to be sure, it wasn't just father Dick who did the work. Throughout the day Ricky toughed out painful body spasms and the kind of fatigue few of us have known. He blocked out his own pain by choosing instead to cheer on other competitors, like me (I'll explain later). As the day went on, Ricky's unending display of strength and courage overwhelmed his father, flooding him with the inspiration needed for an amazing run. Their finish at 9:45 PM, well over 2 hours ahead of the midnight cut-off for able-bodied athletes, still ranks as one of the greatest in the history of the Ironman.

To this day, what fascinates me most about the Hoyts isn't that they finished the race; it's that they even started it. With a condition as debilitating as Ricky's, the daily tasks of life - like eating, dressing and taking on the day - are extraordinarily difficult. Who could fault anyone facing such a reality for adopting a "life isn't fair" attitude and accepting all the many things they just won't be able to do or enjoy?

That's not how Dick and Ricky live though. They fully believe they belong in Ironman and have proven it several times. The first time I

saw them was on the return ride from Hawi. I was feeling great with strong tailwinds pushing me into the top 40. Suddenly these two guys rode by the opposite way on an awkward looking tandem. I didn't know their story then but they were clearly in dead-last place and I remember feeling sorry for them because, with those winds, their climb to Hawi was going to be a hell-ride.

Shortly thereafter, my dream came to an abrupt end with an end-over-end crash at an aid station. I struggled on but with a separated shoulder my hopes were dashed and the day became an agonizing ordeal, as I rode no handed and then faltered in pain on the run. Finally, 5 miles from the finish, I sat down to rest awhile and that's when a real battle took over my head: "Get up and finish"... "I can't", the voices argued. That's when Dick and Rick appeared again. They were still in last place, not quite to the 100-mile mark and in danger of missing the bike cut-off time, when they saw me bloody and beaten on the side of the rode. Both men shouted encouragement as they rode by, with Ricky leaning out and then turning back to give me his version of the "thumbs-up" gesture. It blew me away that despite all he'd been through in life, it somehow mattered to him that a stranger get up and finish the race.

I did. The gesture changed my entire perspective on what it means to be a champion. Clearly, they were champions extraordinaire. Inspired by them I was able to run hard to the finish in a respectable 9:33. After a trip to the hospital, I returned just in time to witness their sprint home...it still ranks as one of my favorite sports moments ever. They immediately became inspirational icons for me and for my life's work as a motivational speaker for businesses across America.

Not surprisingly, they'll both be back in Kona to race the 25th anniversary Ironman on October 18th and it will be an honor to be on the course with them. We've each aged a bit since 1989 and aren't quite as fast anymore. But that'll just make their finish, at ages 40 and 63, even more remarkable and I'm betting on them to make it.

The next time you need a little inspiration to get up and keep going, think of the Hoyts. They will forever be my role models for how

wrong we are to let excuses and negative thinking prevent us from accepting and achieving our true BreakAway potential.

Tony Schiller is the reigning master's world champion triathlete and recently won the overall title at the 2003 Galena Triathlon at the age of 45. He won his 5th ITU age group title last year in Cancun, Mexico and was named 2002 Master of the Year by USA Triathlon. Tony is also a nationally known business speaker who has helped hundreds of organizations with his positive approach to work and life. He coaches a select few triathletes.

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952-474-3278

The Handbook Every Triathlete Should Have!

Written by Nate Llerandi and Steve Born, the "Secrets to Triathlon Success" handbook is an invaluable resource for any triathlete. Call today for information on how you can get your free handbook.

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Compex Sport

A Shocking New Product

We've found a product that we're extremely excited about and want to give you the scoop. The product is the Compex Sport and we're sure it will become as popular in the US as it already is in Europe. This product revolutionizes the way athletes warm up, workout and recover, giving them a noticeable advantage over the competition. Just ask Simon Lessing, Erik Zabel, Jerry Rice, or Tony DeBoom. They are just a few of the more high profile athletes who use and endorse this product. Of course other European superstars such as Alberto Tomba, Joane Somarriba, and Hermann Maier also use and endorse this product.

OK, enough suspense. You are asking "What could this be?" The Compex Sport is a muscle stimulation device that was developed by the Swiss using revolutionary, proprietary "square wave" technology. This is highly technical stuff, but it is what sets the Compex Sport apart and above every other muscle stimulator available on the market today. Mark our words, over the coming weeks and months, you will be hearing a lot about Compex Sport as the media has already started writing about it (See American Tri - Vol. 2 Issue 3). Several other magazines have editorial coverage in upcoming issues and they have started a big media campaign with full page ads in most of the tri, cycling and running magazines (see the November issue of both Inside Triathlon, and Triathlete). Just remember that you heard about it here first.

Although this product has just become available in the US this year due to FDA clearance, it has been around since 1996 and is the number one selling muscle stimulator in Europe. The entire pro cycling peloton, track and field athletes, skiers, etc., ALL use muscle stimulators for active recovery and pre-event muscle potentiation (also known as warm up) and most use Compex as their device of choice.

The machine offers a variety of programs that allow you to do several types of strength and endurance building workouts. However, the Recovery and Warmup settings are what

interests us most and what we feel you will benefit most from. The actual workout programs are simply icing on the cake so to speak. These won't replace your normal training by any means, but once in a while it sure is nice to be able to sit on the couch to do a workout instead of biking or running in rain, sleet or snow.

Now you are asking, "How does it work?" The unit is about the size of a hand held Game Boy. It has 4 leads that each split into a + and - connection. Sticky pads come with the unit that you place at strategic points on your muscles. All you do is connect the leads to the wire coming from the pad and you are ready to workout. The programs are set so you just have to select upper or lower body and off you go. You can turn the TV on, kick back on the couch and let the program do its magic.

Electro-Stimulator units are fairly commonplace and in Europe they are a dime a dozen. We were skeptical at first because we hadn't seen anything like this that we thought was worth spending ANY money on. However, after researching (yes, we did conduct our own research and although we can't talk about it now, you will be the first to know when we can.) and using the Compex, it was evident that this product was designed with a sound scientific approach unlike anything else like it on the market.

According to one of our in-house testers, Joe Arnone "I will be using the Compex this winter to thoroughly test the training programs and I expect I will get an invitation to help Lance win his 6th Tour de France when people see how strong I am next spring!" With extensive personal testing, we have become TOTAL believers in the effectiveness of the Compex Sport". Brian and Dr. Bill will comment further on their experiences with this device in the next issue of Endurance News.

So, what's the catch? Really, there isn't a big one, but there are a few things that should be pointed out before the final decision is made. First, because the unit uses electricity to stimulate your muscles, there is a "shock" aspect

that cannot be avoided. It's really more of a tingling sensation and something that you get used to rather quickly and actually may come to enjoy as it has a massaging kind of effect. Because you have the ability to control the intensity transmitting from four separate channels, you can control how powerful the "tingling" sensation is. Initially, you start with low settings and work your way up as you become accustomed to the sensation.

Secondly, the leads or electrodes have to be affixed to your muscles. If your legs are not shaved, getting a good contact through the hair can be a little difficult and pulling the electrodes off of your legs can be a little painful. For those of us who do shave, it may be the best justification for the habit to ever come along. These electrodes will wear out and need to be replaced periodically. They are not expensive and can easily be ordered directly through us.

Thirdly, it takes time. The recovery program is 24 minutes long. Usually, you only do the quad muscles, but if you wanted to do a complete leg recovery, you'd have to do one for the quads, one for the hams and one for the calves totaling almost 1.5 hours.

Despite these minor issues, we believe that the benefits significantly exceed the drawbacks and more than justify the price. If they didn't and if this product didn't do everything it claims to, you would not be reading this article.

The Compex sport is now available directly from us for \$899 (+ \$15 shipping). Each unit comes with a complete electrode placement guide as well as an interactive DVD that helps you design and track your workouts using the device. You can be among the first to get your hands on one of these amazing machines by calling us at (800)336-1977. If you order before the end of November, we'll waive the shipping charge.

The January 2004 issue of Endurance News will feature a much more detailed article but we wanted to get this info to you while it's still hot.



QUESTION:

I just watched some Sunday evening news program that was recounting the horrors of GHB (a.k.a. date rape drug). The show went on to explain that HTP a compound found in many sports related enhancement products, was merely a precursor to GHB and created GHB when ingested. REM Caps contain some form of HTP. GHB, according to the show, creates severe addictions, central nervous system disorders, etc.

Fact or fiction, is the HTP compound listed on the REM Caps label the very same compound that leads to the maladies mentioned in the television program, by turning into GHB in my body?

ANSWER:

Before addressing issues presenting supplement misuse or overdose, it is given that even water if underhydrated or overhydrated can lead to life-threatening disorders. The REM Caps product contains only 25 mg 5-HTP (5-hydroxytryptophan) per capsule. No significant adverse effects have been reported in clinical trials of 5-HTP. Comparatively sleep studies reported no apparent safety issues even when subjects consumed 1500-2500 mg of GHB. Therefore we are talking about major dose differences as is related to deepening REM sleep state. As with all E-CAPS dose objectives our intention is to aid not overwhelm the system causing harm or ill effect.

GHB pharmacokinetics are related to serotonin metabolism and deep sleep state. 5-HT (Serotonin) and 5-HTP metabolic fates are closely related converted by enzyme to Serotonin or 5-HT. GHB is a neurotransmitter or neuromodulator in the CNS. GHB has moderate or little effect (depending on dosage) on acetylcholine, noradrenalin and serotonin activity. GHB has the increased potential to cause problems and should not be used, though some alternative medicine researchers, such as South and Dean argue that GHB is a safe anti-aging natural metabo-

lite. I do not agree.

NOTE: South's article may be found at www.anti-aging-systems.com/extract/gbh.html

GHB METABOLISM

GHB (Gamma-Hydroxybutyric Acid) is a hydroxylated form of the short-chain fatty acid. GHB is closely related to GABA (Gamma-Aminobutyric Acid), chief inhibitory neurotransmitter of the mammalian nervous system. A French physician, Laborit, in the 1960's was studying the action of GABA in the nervous system, though GABA is unable to cross the blood-brain barrier. Laborit hoped that by adding a hydroxyl (OH) group to butyric acid, the resulting molecule-GHB-would be protected from being destroyed by beta-oxidation (the process by which cells 'burn' fat), would cross the blood-brain barrier, and then serve as a precursor to GABA once in the brain.

GHB is pharmacologically distinct from GABA, even though later research showed that GABA and GHB are interconvertible in the brain through a common metabolite-Succinic Semialdehyde (SSA). It is now known that 0.08% to 0.16% of whole brain GABA is normally converted to GHB each minute. The significance of GHB in the brain concludes: "There is little doubt that GHB is not merely a by-product of GABA metabolism. Clearly it has distinct neuro-physiological and pharmacological actions, many of which are undoubtedly the result of the activation of specific GHB receptors. The evidence is fairly substantial that GHB plays a role in the functioning of the central nervous system, perhaps as an inhibitory transmitter acting on dopaminergic neurons. The actions of GHB make it a viable candidate as a neurotransmitter or neuromodulator in the CNS. GHB has moderate or little effect (depending on dosage) on acetylcholine, noradrenalin and serotonin activity. GHB has been shown to induce major increases in plasma growth hormone (GH) levels by around 600%, but a 3-hour marathon may raise post-exercise hGH circulating levels to above 1500%.

Release of hGH in sleep suggests an anabolic function from enhancing slow-wave sleep. GHB in normal subjects speeds up onset and increases amount of slow-wave (stage 3 & 4) sleep. When GHB is catabolized (broken down), it is converted into Succinic Semialdehyde (SSA). SSA is converted to

Succinic Acid, a Krebs cycle metabolite. The Succinic Acid is then oxidized through the Krebs cycle in the ATP-producing mitochondria, eventually becoming water and carbon dioxide, as has been experimentally verified following radioactively-labeled GHB administration. The properties of GHB, slowing of heartbeat, respiration, mild hypothermia, muscle relaxation, lowered brain and muscle energy consumption, increasing of the deep and restorative sleep phases (stages 3-4 slow-wave sleep), increasing growth hormone output, integrate a regeneration reflex.

The published literature on GHB has consistently shown it to be a safe and non-toxic substance, rapidly metabolized, usually within 2 or 3 hours. However, because of its powerful sleep inducing and muscle relaxant effects, it may not be the supplement of choice, especially in higher doses. In addition, GHB may potentiate the neuro-depressive effects of other agents (e.g. alcohol, opiates, benzodiazepines, barbiturates, etc.), all of which can by themselves severely depress-or even stop breathing. We are talking about 1500 milligram GHB dose and above for creating the effects on enhancing sleep state increasing regenerative hGH levels.

5-HTP METABOLISM

South also wrote, "5-hydroxytryptophan (5-HTP) is the less well known cousin of SEROTONIN (5-HT), one of the most important brain neurotransmitters. Tryptophan is first converted to 5-HTP in nerve cells by a vitamin B3 dependent enzyme, and then 5-HTP is converted to 5-HT by a vitamin B6 dependent enzyme. Yet thanks to modern science, we can now take preformed 5-HTP, with many consequent advantages. 5-HTP passes through the blood brain barrier into the brain far more easily than tryptophan, and getting tryptophan through the blood brain barrier is the main bottleneck, which in many people leads to inadequate brain serotonin levels. Also, 5-HTP is not used to make proteins in the body, while tryptophan is, so there isn't competition by cells outside the brain for 5-HTP, as there is for the body's scarce tryptophan supplies. The body often uses tryptophan to make vitamin B3, at a very high cost of 60mg tryptophan to make just 1mg B3! 5-HTP is not wasted to make vitamin B3. Tryptophan can be broken down in the liver by pyrrolase, an enzyme that converts tryptophan to

kynurenine and its metabolites, which can be mildly liver toxic at high levels. 5-HTP is not metabolized through this pathway. Because of this, tryptophan supplementation especially in chronically stressed people should be kept to 1 gram (1000mg) per day or less, because the stress hormone- cortisol activates pyrrolase.

The work of HM van Praag, SN Young and others over the last 20 years, shows that serotonin is a key brain neurotransmitter involved in mood regulation (anti-anxiety and antidepressant), impulse control (inhibits aggression and obsessive compulsive disorders [OCD], pain control and sleep). Serotonin is also the precursor for our pineal gland's production of melatonin. Human clinical studies show that 5-HTP is a far more efficient increaser of brain serotonin than tryptophan. Further, when 5-HTP has been compared to tryptophan in human studies, 5-HTP has been a far more successful antidepressant, even when the tryptophan dosage used is 10 to 15 times higher than the 5-HTP dosage. Also, relapses back into depression are more common with tryptophan than with 5-HTP. Unlike tryptophan, 5-HTP has been shown to increase brain dopamine (DA) and noradrenaline (NA) activity. These are two key mood and alertness regulating neurotransmitters, and when tyrosine, the amino-acid precursor for brain DA/NA is given along with 5-HTP, the effect is even more powerful [1].

5-HTP SIDE EFFECTS NIL

No significant adverse effects have been reported in clinical trials of 5-HTP. Side effects appear to be generally limited to short-term, mild digestive distress and possible allergic reactions. A potential safety issue with 5-HTP involves an interaction with a medication used for Parkinson's disease: carbidopa. Several reports suggest that the combination can create skin changes similar to those that occur in the disease scleroderma [2, 3, 4]. With excess or high dose, serotonin levels can be elevated too high, causing a dangerous condition called "serotonin syndrome." In humans, excess 5-HTP includes such symptoms as confusion, agitation, rapid heart rate, high blood pressure, muscle jerks, loss of coordination, sweating, shivering, fever; and rapid breathing; coma and death are possible. Serotonin syndrome might also occur if 5-HTP is combined with drugs that raise serotonin levels, such as SSRIs (e.g.,

Prozac), other antidepressants, or the pain medication tramadol.

PEAK X

One report in 1998 raised a potential safety concern with 5-HTP. Researchers discovered evidence of an unidentified substance called "peak X" in a limited number of 5-HTP products [4]. Peak X has a frightening history involving a supplement called tryptophan (related to 5-HTP). The body turns tryptophan into 5-HTP, and the two supplements have similar effects in the body. Until the late 1980s, tryptophan was widely used as a sleep aid. However, it was taken off the market when thousands of people using tryptophan developed a disabling and sometimes fatal blood disorder called eosinophilia myalgia. Peak X, was induced through a manufacturer's mistake, is thought to have been the cause, although not all experts agree. Despite this one report, it is unlikely that 5-HTP could present the same risk as tryptophan because it is manufactured completely differently. Peak X has not reoccurred from 5-HTP samples, and no epidemic of eosinophilia myalgia has occurred with 5-HTP use. The Peak X issue is probably a non-issue with 5-HTP [5].

PRESCRIPTION RX INTERACTIONS

Prescription antidepressants (including SSRIs, MAO inhibitors, or tricyclics), the pain drug tramadol migraine drugs in the triptan family (such as sumatriptan): Do not take 5-HTP in addition except on a physician's advice. The Parkinson's disease medication carbidopa: Taking 5-HTP at the same time might cause skin changes similar to those that develop in the disease scleroderma.

CONCLUSION

The long and short answer to your question is that the 25 mg 5-HTP in REM CAPS is minute and therefore harmless but it may when combined with melatonin, magnesium, valerian deepen REM sleep state effectively.

REFERENCES

Available upon request

Nate's Corner

by Nate Llerandi

Time to Work on Weaknesses

The competitive season is over for most of us, and soon will be for the rest of us. Now is the perfect time to look back on your training & racing to assess your weak points.

As a triathlete, maybe your weakness compared to your fellow competitors is swimming. Maybe as a cyclist you lack the power to stay up with the pack on the climbs. As a runner, maybe your lack of speed keeps you from being competitive at the shorter distances (like 5ks).

When turning a weakness into strength, the key is to focus on that weakness while down-playing your existing strengths. In the case of the weak-swimmer triathlete, this would entail 1-2 cycles of training where swimming was the focus. With each cycle lasting 4-5 weeks, this turns into 8-10 weeks of concentrated effort in the pool. Let's say this triathlete swims 2-3 times per week normally. In a Swim Focus cycle, he/she would swim 4-5 times per week. But to keep weekly hours manageable, a cut back in cycling and running is necessary. To keep your fitness relatively stable in the other two sports, the triathlete could cut back to two workouts per week per sport.

For the cyclist lacking climbing power, time in the weight room will help, with an extra emphasis on the legs. Also, intense repeats lasting from 20 seconds to 2 minutes will help boost leg power. If you live in a nice climate year-round, then these repeats should be done up a steep climb.

These short intervals are potent and should be done 1-2 times per week.

Likewise, the runner lacking speed for the short races needs to increase the amount of interval work he/she is doing. Two workouts a week on the treadmill or at the track, done at 5k race pace will do wonders to boost your overall speed.

Again, over the course of 1-2 cycles, you can see a significant improvement to your weaknesses. By shifting your focus, you can improve without necessarily training more. It's a matter of training smarter. And this will make you a better athlete in time for next season.

Happy Training,
Nate Llerandi

How Long Will Sustained Energy & Perpetuem Keep After Mixing?

by Bill Misner, Ph.D., C.S.M.T.

INTRODUCTION

When a preservative-free soy protein solution is mixed with carbohydrate solution, aerobic bacteria may proliferate in time after they are mixed in solution. How long does this process take and how do we know when it is not safe to drink a bacterial spoiled solution? A negative sour, pungent taste or odor indicates solution should not be consumed. A measure of actual microbial growth rate in non-chlorinated well water, Hammer Gel, Sustained Energy, and Perpetuem was taken to determine unsafe aerobic bacteria growth rate after mixing energy drink solutions. Furthermore aerobic bacteria numerical growth rates were measured following freezing and thawing the same solutions, a preservative anti-spoilage protocol recommended by some athletes.

WHAT CAUSES AEROBIC BACTERIA GROWTH IN ENERGY DRINK SOLUTIONS?

Energy drink powders containing no preservatives are advantageously predisposed to "activate" donor macronutrient benefit for the energy cycle mixed in solution. Time, temperature, humidity, environmental airborne or endogenous microbes, oxidation factors may cause fatty acids to turn rancid or proteins to "sour" in the presence of either long chain or short chain carbohydrates. A prime example is found in pasteurized milk. Milk typically sours in stages as one type of bacteria is replaced by another. The odor or taste of spoiled milk confirms spoilage and the presence of aerobic bacteria. Bacilli convert protein into ammonia products. Ammonia excess generally precipitates premature fatigue.

This phenomena is reported also soy-protein energy drinks, including E-CAPS' Sustained Energy and Perpetuem. If these products are mixed prior to an event, then exposed to temperatures above 59 degrees and consumed later than 6 hours after mixing, a bacteria-induced spoiled energy drink is possible. Soy milk souring also occurs from natural fermentation. As bacteria increase, they convert alcohol/sugar fractions to acetic acid when contacting air. As Soy protein isolates are mixed in solution following a minimal 4-hour fermentation period, the initial acidity of 5.5

pH decreases a full point the first 7 hours after mixing to 4.5 pH as a profanation of fermentation and time, particularly in the samples enriched with sucrose or other carbohydrates. Protein-enhanced Rice sours strikingly similar as its fermentation process proceeds.

METHOD

In an open-label experiment, aerobic bacteria were numerically measured in non-chlorinated well water, Hammer Gel, Sustained Energy, and Perpetuem in 1% and 20% solutions respectively. Each solution except tap water was mixed as 1 part solute within either 4 parts sterilized distilled water or titrated in a 1:100 mixture with sterilized distilled water. A Sani-Check AB-test strip was then dipped in the 1:4 or 1:100 mixtures and incubated at 25-30° C for 24 contiguous hours to determine AB count at the time of test sampling. Measurements of aerobic bacteria growth rate were determined at the end of each incubation period. Each solution was then placed on a Sani-Check AB test pad strip, courtesy of Biosan Laboratories Inc. The results of these tests is shown in Table 1.

Athletes should be encouraged to keep pre-mixed protein-enhanced or lipid-containing carbohydrate drinks cool, i.e. under 59° F, or ideally at a cooler 40-45° F in order to reduce the rate of aerobic bacteria growth within the drink mixture. Freezing the drink the night before an event may result in keeping the macronutrient contents in tact an inhibiting bacterial growth potential.

SUSTAINED ENERGY & PERPETUEM FRESH COMPARED TO FROZEN SAMPLES

The question begs: What happens if Sustained Energy or Perpetuem is frozen the

night before and event, then allowed to thaw? Does this intervention reduce spoilage and microbial growth rate?

A single scoop of Sustained Energy or Perpetuem were separately mixed in 8 fluid ounces of distilled water and sample was incubated on a SaniCheck AB test pad to determine if microbial Aerobic Bacteria existed in the "Fresh Mixtures." The remnants were frozen solid overnight in a freezer compartment. The following day the contents were allowed to thaw until a liquid state was reached, then samples were taken following a 3-hour exposure or later following 6-hour exposure to temperatures ranging from 60°-78° F. Samples from each, a 3-hour and 6-hour exposure, were taken from each water bottle for determining their rate of aerobic bacteria growth if any.

FRESH SAMPLES SUSTAINED ENERGY AND PERPETUEM

To confirm the rate of spoilage and to determine how/when to mix Sustained Energy and Perpetuem for optimal application, a third 1 scoop of Sustained Energy and Perpetuem was mixed with distilled water in separate sterilized containers. A sample of each was immediately incubated to determine the microbial Aerobic Bacteria when the sample was initially mixed. A sample of each was tested using a Biosan SaniCheck AB-test kit. After a 24-hour incubation period, Sustained Energy's Aerobic Bacteria count was NO AB /milliliter. After a 24-hour incubation period, Perpetuem's Aerobic Bacteria count was NO AB /milliliter.

FROZEN SAMPLES SUSTAINED ENERGY AND PERPETUEM AFTER 3 HOURS

HAMMER GEL, SUSTAINED ENERGY PERPETUEM 1-20% SOLUTIONS

TABLE 1

SOLUTE	AEROBIC BACTERIA/milliliter
Well Tap Water	0
Hammer Gel	0
Sustained Energy	0
Perpetuem	0

The remaining 7 fluid ounce samples were immediately frozen overnight in a freezer compartment, then allowed 3 hours thawing before returning from solid frozen state to liquid state. A sample of each was tested using a Biosan SaniCheck AB-test kit. After a 24-hour incubation period, frozen-thawed Sustained Energy's Aerobic Bacteria count was NO AB /milliliter. After a 24-hour incubation period, frozen-thawed Perpetuem's Aerobic Bacteria count was NO AB /milliliter.

FROZEN SAMPLES SUSTAINED ENERGY AND PERPETUEM AFTER 6 HOURS

The remaining 6 fluid ounce samples were allowed 6 hours thawing before returning from solid frozen state to liquid state. A sample of each was tested using a Biosan SaniCheck AB-test kit. After a 24-hour incubation period, frozen-thawed Sustained Energy's Aerobic Bacteria count was NO AB /milliliter. After a 24-hour incubation period, frozen-thawed Perpetuem's Aerobic Bacteria count was NO AB /milliliter. (Table 2)

WHAT INCREASES MICROBIAL PROLIFERATION RESULTING IN ENERGY DRINK SPOILAGE?

It is estimated that E-CAPS energy products mixed in 10-20% solutions and consumed during a 6-hour event will NOT permit spoil due to bacterial growth. However, if a small amount of energy drink is left to sit in a water bottle for up to 15 days, excessive fermentation-induced spoilage from bacterial growth may result. Athletes reusing water bottles without thoroughly washing and drying them increase the risk of gastric stress especially from microbial advanced generation (log) growth in the heat.

METHOD

A test was determined to represent what

occurs when water bottles are not thoroughly washed between use of either product. A small fluid ounce sample of Sustained Energy (SE) and Perpetuem (PR) was left to deteriorate in a water bottle for 15 days. Two each newly mixed samples and two each of the 15-day-old fluid ounce samples of Sustained Energy and Perpetuem were retested in the lab for their respective rate of aerobic bacteria growth. Both Sustained Energy and Perpetuem were mixed in 20% solutions noted as "Today Solutions" or as "15-Day-Solutions".

The "TODAY SOLUTIONS" were fresh giving off no odor but the "15-DAY SOLUTIONS" had spoiled presenting a pungent odor. The "TODAY SOLUTIONS" exhibited pH of 6.6 for Perpetuem and 5.8 for SE, while the "15-DAY SOLUTIONS" had become so highly lactic-acidic, they were not measurable by pH paper, which only goes to as low as 5.5 pH. Each of the test-sample solutions were further titrated to a 1:100 solutions, the ideal medium for bacterial proliferation, and incubated at 25-30 C (77-86 F) in an enclosed aerobic bacteria SaniCheck-AB test pad medium (-1) 2, then subsequently measured for 24 hours later to determine the Aerobic Bacteria Count. This determines the approximate number of bacteria present within each sample at the time of test pad sampling.

The results comparing a clean water bottle to an unclean 15-day old water bottle are shown in Table 3 on the next page.

DISCUSSION

Is there a reliable record on report that microbes grow in water bottles? Dangerous bacteria and potentially toxic plastic compounds have been found in the types of water bottles typically reused in classrooms and workplaces were studied. Examination of 76 water bottles at a Calgary elementary school

in Canada found bacterial contamination in children's bottles that would prompt health officials to issue boil-water advisories had the samples come from a tap [1]. Total coliform exceeded water quality guideline values in 13.3% of 75 samples, while faecal coliform and total heterotrophic criteria were exceeded in 8.9% (of 68 samples) and 64.4% (of 76 samples) respectively. The bacteria likely came from children's hands and mouths over time as they repeatedly used the same bottles without washing them or allowing them to dry.

A US study suggests the kind of thorough washing that could kill bacteria might make the bottles unsafe in another way [2]. Frequent washing might accelerate the breakdown of the plastic, potentially causing chemicals to leach into the water. Preliminary research at the University of Idaho found that with repeated use, toxic chemical compounds such as DEHA, can migrate out of plastic bottles made from polyethylene terephthalate (PET). This contradicts earlier research at EAWAG, Swiss Federal Institute for Environmental Science and Technology, which found no indication for migration of possible photoproducts or additives from PET bottles into water [3]. The use of PET bottles for solar water disinfection (SODIS) is widely promoted for developing countries [4].

CONCLUSION

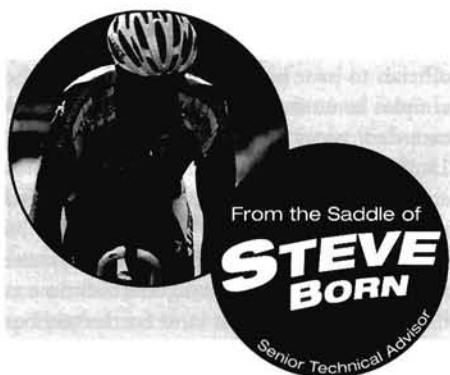
These tests demonstrate that aerobic bacteria do not present detectable numerical values during the first 6 hours in tested sample solutions of Hammer Gel, Sustained Energy, or Perpetuem. This study reports similar parallel results from systematically testing fresh solutions, frozen-thawed solutions after 3-hour element exposure, and post-6 hour element exposure. NO numerical aerobic bacteria were observed in any samples even 6 hours after

(see MIXING on page 13)

AEROBIC BACTERIA COUNT SUMMARY

TABLE 2

SUSTAINED ENERGY			PERPETUEM		
FRESH 0 HOURS	FROZEN THAWED +3 HOURS	FROZEN THAWED +6 HOURS	FRESH 0 HOURS	FROZEN THAWED +3 HOURS	FROZEN THAWED +6 HOURS
NONE	NONE	NONE	NONE	NONE	NONE



Welcome to the autumn issue of Endurance News! Even though this issue has many articles and stories in a variety of subjects I like to refer to it as the "Science Issue." Dr. Bill has done it again, providing some excellent science-based articles that are sure to help you with enhancing both athletic performance and overall health. The problem I always run into though is that I have so many great articles on file from Dr. Bill that it's tough to pick out just one or two. The articles that made their way into this issue are ones I hope you will find as valuable as I have.

J.O.E. 100 CD

That leads me to mentioning the remarkable body of work that is the J.O.E. 100 CD. We first mentioned the J.O.E. 100 CD back in Endurance News #38 and if you're at all interested in the fascinating world of supplements, nutrition, and other things pertaining to athletic performance and general health you owe it to yourself to purchase a copy for yourself. Having spent hours reading through this great information I can honestly say it's fantastic and, at \$49.95, it is an unbelievable bargain.

The J.O.E. 100 CD is a 753-page compilation of the first 100 issues of the Journal of Endurance. It's a current, subject-searchable, research-reference tool for all facets of endurance exercise. Comprised of published research, technical articles, and field tests, the J.O.E. 100 CD is filled with relevant articles and studies with timeless advice for athletes in all disciplines at any level. Again, it is a fantastic piece of work so do consider getting a copy for yourself or someone you know...after all, Christmas is right around the corner.

EVENTS GALORE!

There are so many great endurance events

that we're sponsoring, so many that I can't list them all. One of the more prestigious upcoming events is the USARA Adventure Race National Championship on November 7-8 in Lakeshore, California. The race is hosted by Sierra Multisport Productions (www.sierramultisport.com) and headed up by Faron Reed. More information can be found at www.usara.com/natnl.htm

Another event we're really pleased to support is the San Diego 1 Day, which is this year's USA Track & Field 24-Hour National Championships. Race director John Metz writes, "Many of the country's best ultra distance runners will compete in San Diego for the 2003 USA Track & Field 24-hour ultra distance national championship. Hosted by San Diego 1 Day Race Association, the race will be held November 8-9 at the University of California, San Diego all-weather track near the beautiful shores of La Jolla." This should be a competitive race and more information can be found at www.sandiegoidayrace.com

On December 13, at Huntsville State Park in Huntsville, TX you'll find us at the Sunmart Texas Trail Ultra Run the largest ultra trail run in the U.S. with 867 finishers in 2002. Last years race included women's 50-Mile race winner Connie Gardner, one of our sponsored athletes and this year's U.S. National 100 Mile Road Running Champion. Sunmart is a fantastic race and we're excited to be there. For more information about the Sunmart Texas Trail Ultra Run visit www.sunmart-pwi.com

REMARKABLE ATHLETES!

One of the features I like best about Endurance News is that it gives us the opportunity to "show off" some of our athletes and their fantastic race results. The bummer is that there are so many great athletes producing so many great results that we could fill up several issues of the newsletter with just those. Still, if you've got some race results that you'd like us to consider for future issues of Endurance News, we'd love to hear from you! Elsewhere in the newsletter you'll find all the info you need on how to contact us.

This issue features some terrific athletes - Connie Gardner, Lisa Smith-Batchen, Susan Wallis, Joanna Chodorowska, Justin Thomas, and the Hammer Nutrition/Truativ adven-

ture racing team - what they've done and how they used the products to get them there. Congratulations to all these tremendous athletes. Hammer on!

FUTURE EVENTS/ ATHLETES REPORTS

A lot of great events are happening just between issues of Endurance News and we'll report on all of them, and of course the Hammer Nutrition athletes competing in them, in the next issue. Prestigious races such as the Ironman World Championships in Kailua-Kona, Hawaii, the Furnace Creek 508 through Death Valley, California and the Nissan Xterra World Championship in Maui, Hawaii will take place between issues and I'm looking forward to following them and seeing how our terrific athletes do in them.

It's hard to believe that winter is just around the corner but a sure sign that it is are all the emails that I'm already receiving from Nordic Skiing race directors! Wow! Where did summer go? I hope wherever you are that you've had a healthy, successful, and all-around great summer. Enjoy this issue of Endurance News and, speaking on behalf of all of us here at E-CAPS/Hammer Nutrition, thank you for being a part of our family. Have a great autumn season!

Sincerely -

MINI-CLASSIC II

Countertop Water Distilling System



Two units in stock. Regular price \$475 + \$15 shipping...now just \$400 plus shipping. Order before November 30th and get a free can of Lumen cleaner!

1.800.336.1977

Fully automatic units also available.
Call for more information.

(*MIXING from page 11*)

mixing each solution in clean containers. Freezing and thawing solutions may therefore prevent spoilage and present a convenient method for immediate use in an event at least 6 hours after completely thawing the solution.

FOOTNOTES

1 Typically Soy milk or soy yogurt samples during early stages of fermentation present a compatible 5.5 pH when fresh.

2 The designation "AB" stands for Aerobic Bacteria. Aerobic bacteria are those organisms, which require oxygen, and SaniCheck-AB test strips will support the growth of these microbes. Most bacteria that contaminate the environment will grow on Sani-Check AB test strips. Examples of these are included in the genera of *Psuedomonas*, *Enterobacter*, *Escherichia*, *Klebsiella*, *Flavobacterium*, and *Alcaligenes*, to name a few. Aerobic bacteria possess the ability to form red spots on the Sani-Check AB test strip. The number of spots along with the degree of background reddening is used to derive a quantitative measurement of microbial growth. Following incubation, the strip is compared to a color chart on the label. The value obtained from the chart allows for an estimated bacterial count to be made. However, if the water bottle containers are not thoroughly washed soon following use, aerobic bacteria will generously proliferate

resulting in an increased risk of bacteria-induced premature energy drink spoilage resulting in gastric stress. A water bottle container may be effectively cleaned by application of hot soapy water, rinsing with a 0.15-0.3% solution of hydrogen peroxide, or boiling water. If a water bottle is not effectively cleaned between usage, microbial regeneration may be activated causing premature energy drink spoilage typically defined by a pungent odor and sour taste. If an energy drink smells or tastes sour, it has likely spoiled and should not be consumed.

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2003 Subaru Primal Quest

80 teams competed in what is arguably America's largest, most prestigious, and most difficult adventure race. This year's race began at 8:30 AM on September 5 in the South Lake Tahoe region of California and Nevada. 31 mandatory checkpoints had to be passed via a tough course that featured trekking, orienteering, flat water and white water paddling, mountain biking, caving and rope work.

At 02:13 AM on September 10 the first team, Nike ACG/Balance Bar reached the finish line, 6.5 hours ahead of the second place team, Australia's Team AROC. In all, 53 teams finished.

E-CAPS/Hammer Nutrition was well represented at this great event with 8 fully sponsored teams completing the tough course:

4th Place - Team Parallax
8th Place - Team Epinephrine
13th Place - Team RacingAhead.com
23rd Place - Team Leatherman/Stray Dogs
33rd Place - Team Photopens.com
36th Place - Team E-CAPS Florida
42nd Place - Team No Boundaries
46th Place - Team SPQV

Congratulations to all you amazing athletes on a job well done!

Special congratulations to long-time E-CAPS/Hammer Nutrition sponsored athlete Danelle Ballengee of the first place Nike ACG/Balance Bar team. "Nellie" is perhaps the best female adventure racer competing today and she and her team have had a magnificent summer of racing, highlighted by this tremendous win.

CBS will be televising two full hours of this year's Subaru Primal Quest on January 10, 2004. More information about the race can be found at subaruprimalquest.com

TABLE 3

PRODUCT	CLEAN WATER BOTTLES (TODAY SOLUTION) UP TO 6 HOURS Aerobic Bacteria Count/ml	UNCLEAN WATER BOTTLES (15-DAY OLD SOLUTION) Aerobic Bacteria Count/ml
SUSTAINED ENERGY	0	1,000,000,000 (Maximum/ml/pad)
PERPETUEM	0	10,000,000

It's That Time Again!

Get your wish list ready...it's time for the 15th annual Client Appreciation Sale.

From November 3rd-30th we'll once again have all products (with the exception of Hammer Gel) on sale as our way of saying thanks to you for another wonderful year.

The Client Appreciation Sale is a fantastic time to stock up for next year and, with Christmas fast approaching, it's a perfect time to do a little holiday shopping for any athletes in your life.

Some of the products to take note of are the 8-

Serving Perpetuem. Do the math and you'll see that it's a great deal. Also, notice our featured product Mito-R Caps. We've had an amazing response to this new product and know that everyone can benefit from it.

Happy Shopping!

Race Report

Catching Up With Our Amazing Athletes

Connie Gardner

Amazing Feet

I've been using Perpetuem as my drink this summer for the races. It's been going great. I raced a 50k in Punxsutawney, PA at the beginning of the month. There was some competition there so I had to work harder than usual. I ended up winning with a new course record. The next few days after the race my legs were pretty tired so I drank my Hammer Pro Whey and Soy drinks religiously. I was able to recover within the week and went on to the US National 100 mile road Championships the following Saturday. There I won with a new Championship 100 Mile record. I know I couldn't have performed the way I did in these races without your products.

Thanks so much for all your support!
Connie Gardner

NOTE: This is an outstanding achievement by the amazing Gardner. She set a new women's championship record of 16:22:15, almost 20 minutes from Christine Gibbons' 1989 mark of 16:41:26. Connie finished more than 7 miles ahead of runner-up Janet Runyan (17:45:43) of Boulder, Colorado. Way to go Connie!

Joanna Chodorowska

A Perfect Patriot's Day

I still think it is pretty surreal, but I won my first triathlon this morning. I never thought it was possible. 1st in my AG, sure, but 1st overall???

The race was the Patriot's Day sprint triathlon - 2nd annual race (Sept 21st). It is a really fun course and nice and short... 800-yard swim, 14 mile rolling bike, and then a 5 K run. I knew I swam well, and was in the top 5 most likely out of the water. On the bike I passed a few women and then rode alone for many miles, thinking I was off course - there was no one ahead of me or behind me. I was in the 3rd wave, so there should have been people for me to catch right? And 2 waves behind me, so the guys should be catching up, too. But there was

Lisa Smith-Batchen

A Grand Slam

I'm so pleased to be able to write this email to you. The Wasatch 100 (ultra running race, Sept 6th) was this last weekend. 26,000 feet of climb uphill and then the same downhill. Needless to say, I'm tired, my feet hurt and I need a massage! :)

I finished Wasatch 4th women overall and I WON the Grand Slam for the women. This puts me in the place where no other runner has done the Badwater 135 (July 24th) and the Grand Slam in the same year.

I followed the plan you gave me and all I can say is it worked like magic.

I'm so thankful!
Lisa Smith-Batchen

Susan Wallis

Age Group Win In Austria

Just wanted to let you know I won my age group in IM Austria this past weekend (my first age group win in a WTC Ironman!) and qualified for Hawaii this October. I also set a personal record for all my iron distance tris at that event (it was my 18th iron distance tri), with each discipline also being PR's, completing in 11:20:59.

I used Perpetuem and Endurolytes exclusively during the race and refueled with the Hammer Pro Whey after the event. I felt great after the race and was able to eat food right away (years ago, before using Hammer Nutrition, I would have difficulty eating for 24 hours and was not hungry either). I also had very little soreness the two days following. It was just like I had done only a 4-5 hour workout instead of 11 hours on a hilly course (for someone who has elevation changes of about 10 feet here in North Florida).

Thanks,
Susan Wallis

no one. Luckily I saw a marking on the road - a big green B with an arrow. What a relief, I was on course!

I was so surprised when I got to the transition to hear "oh, I think we have our first woman coming off the bike!" Wait, that would be me?!?! Then I realized I am not one known for quickness on the run; usually I get caught here. Then again, the past few weeks I have been really working on the run by going to the track. Maybe I can hold them off... it is only 5 K right? So I ran and ran and ran as fast as I could. Then, at the turn around, I had a chance to see if anyone was close. YIKES! They were only 1/2 a mile behind. There were 2 women trying to catch me... keep running,

keep running! Do not let them catch you. I was intent on running as hard as I could to not get caught. And since this was the first time EVER I had to be first, I figured I should run until I fall over dead. Luckily the dead part did not happen but I almost missed the finishing chute as I was running so intently... and they moved the finish line from where it was last year so I almost missed it!

So there I was for the first time in 11 years of racing triathlons, the overall winner!

Joanna K. Chodorowska

Joanna has been a long-time sponsored athlete of ours...congratulations on your first overall win!

Justin Thomas

Another Exciting Xterra

I wanted to report on a breakthrough race I had last weekend in Keystone, Colorado. I competed at the third stop of the Xterra National Series and finished 2nd overall—my best finish ever in an Xterra Race, only being beaten by Steve Larsen by a little over a minute.

I came into the race being relaxed with no expectations because I was Top 3 in the point series and in years past I have never felt that good at 9,000 feet altitude. I had a much better swim than years past and only came out 45 seconds behind the leaders. Once on the bike I quickly found my rhythm and was able to catch the leaders within a few miles of the long climb to the top of the mountain. Steve Larsen also caught me early in the bike but I was able to keep him in sight for a few miles.

I came over the top of the mountain in a solid 2nd, 2 minutes behind Steve. I had a solid descent back down the mountain, but was caught by Conrad Stoltz going into T2. Conrad sat on my feet for a couple miles into the run until I was able to surge away from him and try to track down Steve. I wasn't able to catch Steve but did cut his run lead in 1/2 by the end of the race.

I felt great the whole day and wanted to share my nutrition plan, which worked to perfection. For breakfast I used the suggestion from "Endurance Athlete's Guide to Success" of 2 scoops of Sustained Energy and 1 serving of Hammer Gel, and a capsule of Endurolytes. I always use Cardio & Enduro caps everyday and of course used them full strength 1 hour before the race start. During the bike portion

I used a water bottle of water/Hammer Gel/Endurolytes and a Hammer Flask with Hammer Gel. On the run I usually have trouble with digesting food so I diluted 1 serving of Hammer Gel with water and another capsule of endurolytes mixed in. Post race I had Hammer Whey with 2 servings of Hammer Gel.

I felt great the whole day and didn't notice the altitude like I have in years past. I definitely owe part of my success to Hammer Nutrition/E-Caps and being able to recover quickly from workouts and staying injury free for the first time in a few years.

Thanks,
Justin Thomas

Team Hammer Nutrition/Truativ

A Mega-Dose of Adventure Action

Team Hammer Nutrition/Truativ finished first of four-person co-ed teams at the Mega-Dose Adventure Race July 11-13, qualifying for the 2003 USARA (United States Adventure Racing Association) National Championships.

Composed of David Darby from Massachusetts, Bill Butcher of West Virginia, team navigator, Vytenis Benetis from Lithuania, and captain, Jennifer Shultis from Massachusetts, Team Hammer Nutrition/Truativ completed the grueling 150 mile course through (and over) many of the Blue Ridge Mountains of Virginia in just under 30 hours. The race started under

Virginia's landmark Natural Bridge on Friday night at the stroke of midnight with a half-marathon and then continued with a mountain bike to the top of Skillern Mountain—a tough and slow climb on gravel fire roads, giving just a taste of what was yet to come. A fast mountain trail decent dropped the team back onto the road where they continued to the James River for a 6 mile white water swim leg at dawn. The mountainous course continued to test the racer's legs on 2 more treks and bike sections, including a tyrolean traverse and rappel rope section high over a rocky river bed.

Team Hammer Nutrition/Truativ crossed

the finish line in Natural Bridge, Virginia just before 6am on Sunday morning.

** From press release*

Athletes....want the E-Caps/Hammer Nutrition community to know what you're up to? Send us a short email to graphic@e-caps.com (please put Race Report in the subject line) about your recent accomplishments and we'll try to include it in our Race Report

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Catching Up With Our Amazing Athletes
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The **e**nd

Congratulations again to this year's Race Across America champion Allen Larsen!

2,921.7 miles in 8 days, 23 hours, 36 minutes



photo by Johnny Boswell

Steve,

You went beyond in so many ways, how can I ever thank you? I loved the Hammer products and they worked so well for me in the race. The clothes, the supplements, advice and just encouragement overall - thank you! It meant a lot and I truly appreciate EVERYTHING!

Sincerely,
Allen Larsen