

ENDURANCE NEWS #27



78 WAYS SUGAR CAN RUIN YOUR HEALTH

by Dr. Joseph Mercola, D.O.

Dr. Mercola is well-respected in the complimentary and/or alternative medicine medical practitioners growing field. His articles posted both on the web and on the written page have enhanced his audience, authority, and popularity among even more conservative medical physicians. Each reason stated concisely and conclusively is supported by at least one research in Dr. Mercola's Bibliography. That's correct, 78 research-supported conclusions that should convince even the most sugar-addicted subject to reduce their active attraction to dietary toxic sweets!

Dr. Mercola is board certified in family medicine and has served as the chairman of the family medicine department at Hoffman Estates Medical Center for five years. He is trained in both traditional and natural medicine. He writes a monthly column for a natural alternative medical journal (The Townsend Letter) and has been interviewed on national and local news. The article is also listed at www.mercola.com/dangers.htm.

In addition to throwing off the body's homeostasis, excess sugar may result in a number of other significant consequences. The following is a listing of some of sugar's metabolic consequences from a variety of medical journals and other scientific publications.

1. Sugar can suppress the immune system.
2. Sugar can upset the body's mineral balance.
3. Sugar can cause hyperactivity, anxiety, concentration difficulties, and crankiness in children.
4. Sugar can cause drowsiness and decreased activity in children.
5. Sugar can adversely affect children's school grades.
6. Sugar can produce a significant rise in triglycerides.
7. Sugar contributes to a weakened defense against bacterial infection.
8. Sugar can cause kidney damage.
9. Sugar can reduce helpful high-density cholesterol (HDLs).
10. Sugar can promote an elevation of harmful cholesterol (LDLs).
11. Sugar may lead to chromium deficiency.
12. Sugar can cause copper deficiency.
13. Sugar interferes with absorption of calcium and magnesium.
14. Sugar may lead to cancer of the breast, ovaries, prostate, and rectum.
15. Sugar can cause colon cancer, with an increased risk in women.
16. Sugar can be a risk factor in gall bladder cancer.
17. Sugar can increase fasting levels of blood glucose.
18. Sugar can weaken eyesight.
19. Sugar raises the level of a neurotransmitter called serotonin, which can narrow blood vessels.
20. Sugar can cause hypoglycemia.
21. Sugar can produce an acidic stomach.
22. Sugar can raise adrenaline levels in children.
23. Sugar can increase the risk of coronary heart disease.
24. Sugar can speed the aging process, causing wrinkles and gray hair.
25. Sugar can lead to alcoholism.
26. Sugar can promote tooth decay.
27. Sugar can contribute to weight gain and obesity.
28. High intake of sugar increases the risk of Crohn's disease and ulcerative colitis.
29. Sugar can cause a raw, inflamed intestinal tract in persons with gastric or duodenal ulcers.
30. Sugar can cause arthritis.
31. Sugar can cause asthma.
32. Sugar can cause candidiasis (yeast infection).
33. Sugar can lead to the formation of gallstones.
34. Sugar can lead to the formation of kidney stones.
35. Sugar can cause ischemic heart disease.
36. Sugar can cause appendicitis.
37. Sugar can exacerbate the symptoms of multiple sclerosis.
38. Sugar can indirectly cause hemorrhoids.
39. Sugar can cause varicose veins.
40. Sugar can elevate glucose and insulin responses in oral contraception users.
41. Sugar can lead to periodontal disease.
42. Sugar can contribute to osteoporosis.
43. Sugar contributes to saliva acidity.
44. Sugar can cause a decrease in insulin sensitivity.

(continued on page 11)



3 NEW PRODUCTS FOR 2000!

Customers often ask if we have any new products that they should know about. Since we will be introducing three new products for the 2000 season, we wanted you to be the first to know. What follows are the descriptions for each of these hot new products. We expect to have all of them in stock and ready to ship by mid-March.

RACE DAY BOOST "When you want it, take it."

RACE DAY BOOST contains one of the most potent, legal, ergogenics used in endurance competition. In the most extensive study to date on the ingredients in RACE DAY BOOST by Kreider [1992], subjects netted an 8% improvement in performance time in a 40K time trial! That's the difference between winning and finishing last! Every race is important, but when one of your most important races of the season is 5 days away, reach for RACE DAY BOOST. The addition of Glutamine to RACE DAY BOOST enhances HGH response and muscle glycogen stores during your pre-event taper. Athletes have reported the following benefits with RACE DAY BOOST:

- Prolonged endurance performance
- An increase in ventilatory anaerobic threshold
- Increased oxygen uptake
- Personal Record performances
- Elevated Human Growth Hormone (HGH) levels

Research strongly suggests oral dosage of Sodium Phosphate significantly contributes

(continued on page 11)

NEW CUSTOMER REFERRAL REWARD PROGRAM

As an existing E-CAPS customer you now have the ability to earn credit towards the purchase of E-CAPS and Hammer Products by referring new customers to us. Here's how the program works: For every new customer you refer to us, you earn points based on the dollar amount of the referred customer's first order.

For EVERY DOLLAR the customer (that you referred to us) spends on his or her first order, YOU EARN ONE POINT. 10 POINTS IS WORTH ONE DOLLAR IN CREDIT TOWARD YOUR PURCHASE OF E-CAPS AND/OR HAMMER PRODUCTS. 20 points equal one dollar in trade for soft goods!

Since the responsibility falls on the new customer to mention your name when they call, we have devised a sure bet way to get them to do this. We will give the first-time customer free shipping on their first order. To make it even easier, we have printed up special "referral cards" that look like a business card. It has a space for your name and customer number (that is optional, in case you don't know it or forget), our 800# and a note telling them that they will get free shipping if they mention your name when they call. We will provide you with these cards with any order. We will also keep track of your points for you so that you don't have to bother with it. Anytime you place an order, you can check to see how many points you have and cash them in at that time or on any future order.

A Few Details:

- A new customer is one that has never ordered any products from EMG. We will

be able to quickly verify this by checking our database.

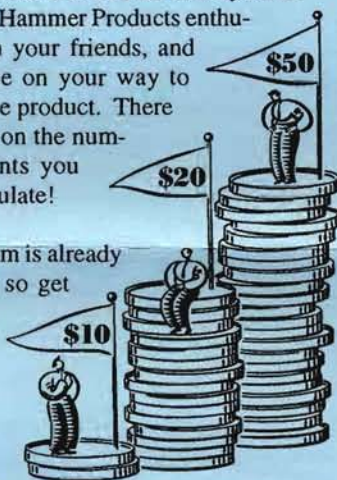
- Points are only earned on new customer's initial order.
- Customer must mention referenced person at time of ordering for points to be earned by referenced customer. Sorry, but we can't make it retroactive.
- Points can be saved and redeemed anytime.

Example Scenario:

Bob, a new customer, orders \$100 worth of product on his first order with EMG. He mentions that Jane sent him to EMG. Jane's account is credited with 100 points. Jane now has \$10 worth of credit towards the purchase of any E-CAPS or HG product, or if she prefers, \$20 worth of credit towards the purchase of any soft goods. Bob will be sure to mention Jane's name when he calls because he will get free shipping if he does.

That's all there is to it! Just share your E-CAPS and Hammer Products enthusiasm with your friends, and you will be on your way to earning free product. There is no limit on the number of points you can accumulate!

The program is already underway, so get going! ■



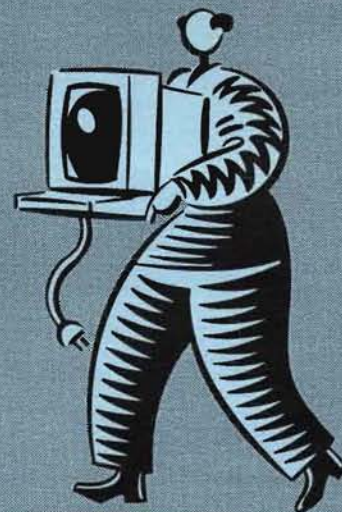
COMPUTER FAILURE

Probably the worst thing that can happen to a business these days is experiencing a computer system failure. Of course anyone who relies on a computer for their business knows the potential for system failure and the importance of creating backup files on a regular basis.

On January 31, 2000, the hard drive on our server completely crashed. No big deal we thought, we'll just replace the hard drive and restore the data from our back up drive. But, as fate would have it, the backup program had also failed, and the last time it backed up our data was on January 21, 2000.

By now you must be wondering why we are telling you this. The reason is we had about 15 back orders which were waiting for the arrival of Orange-flavored Hammer Gel and/or Anti-Fatigue formula. Since we did not have a paper trail on these unprinted invoices, we have in effect lost them. So, if you were one of these people, please contact us so we can fill your order and get it to you right away.

We are terribly sorry some of you were adversely affected by this problem and hope we can make it up to you. And yes, we have learned our lesson well. We will now have a staff member checking everyday to make sure a backup was successfully performed the night before. ■



FROM THE EDITOR

As Nate points out in his article on page 4 of Endurance News, we all made it through the New Year without any major catastrophes. So, now we can get back to the really important things like planning and training for the upcoming season. I am very excited about this year and all of the new products and services that we will offer. 1999 was a record year for E-CAPS and Hammer Nutrition, and I have each one of you to thank for making it possible. So, thank you for your patronage and continued support.

But rather than be content with our growth, I am looking forward to taking it to the next level. Does that mean that I want to grow into a large, impersonal, bureaucratic giant?

Absolutely not! No matter how much we grow, I am committed to offering the same level of personal attention and friendly customer service you have enjoyed from my company in the past. I hope and expect that each one of you will hold me and my staff accountable in this respect. If we ever fall short of providing you with the best products, the best customer service and the best technical support, please let me know. You can reach me by phone, fax, or e-mail. If we should happen to meet or exceed your expectations and you would like to let us know, we'd love to hear about that too. Have a healthy and fast 2000!

Brian Frank

So often I am asked, "If I take supplement 'X,' how long will it take for me to experience the effects?" Age, Gender, Genetics, Training Rate, Dietary Habits, Prescription or OTC Medications, and yes, even the quality of air one breathes or the water drank may either help or hinder micronutrient's total transition time from mouth to stomach to blood to liver to muscles to enhancing ergogenic gains an athlete actually notices or can measure by stopwatch.

The micronutrients Iron, Zinc, Folic Acid, Vitamin B-6, Vitamin B-12, and Vitamin C are each required in order to maintain blood hemoglobin levels [Red Blood Cell Count], the oxygen carriers of endurance exercise. As training is increased, volume-demand for micronutrient components of the RBC's is also increased. "TIME" is required for all micronutrients first to deplete, then to metabolically reassemble, traversing from food and supplements to specific blood componentry required by all working muscle cells. Vitamin B-12, is stored as Cobalamin, in very small amounts, ranging from 100 to 1000 micrograms mostly stored in the liver [+66%], leaving the rest scattered throughout the body [33%] in the lungs, skin, muscles, bones, kidneys, and spleen. Since daily needs are very small, seldom rising above 2 micrograms, deficiency may take years to manifest. Why? Your entire blood supply contains only 5 nanograms per liter or 1/billionth of a gram, representing 1 trillionth of your bodyweight. You would be unable view that small of a particle under most microscopes. The three causes of Cobalamin deficiency are:

- [1] Several years of not ingesting enough Cobalamin-rich foods,
- [2] Lacking the gastric "intrinsic factor" for manufacturing Cobalamin from food,
- [3] Strict vegetarian diets contain little to no Cobalamin from plant-source food.

Such deficiencies, though minute in comparison to other micronutrients, will deteriorate performance, or worse of all, pernicious anemia may develop, causing blindness, insanity, then death.

THE RATE OF MICRONUTRIENT DEPLETION IS MEASURABLE

Dressendorfer et al., [1981] studied 12 male marathon runners who took NO supplements other than their normal food. RBC Hemoglobin Levels were measured during the next 20 days, as these runners doubled their training mileage from 8 miles per day to 17 miles per day. This is equal to training 56 miles/week, then suddenly raising mileage 119 miles per week for almost 3 weeks without preparation. After 2 days training, Hemoglo-



THE MAGIC & MAJESTY OF MICRONUTRIENT MIGRATION

by Dr. Bill Misner, Ph.D.

bin (HB) levels dropped -9.4%, after 5 days HB dropped -12.5%, after 20 days HB was at an all-time low of -15.6% less than the initial training on day one.

When athletes were given increased component-micronutrients required for HB, above the RDA levels of Iron, Zinc, Folic Acid, Vitamin B-6, Vitamin B-12, and Vitamin C, they were able maintain hemoglobin levels without loss of RBC for 12 weeks and each of the athletes significantly increased their VO2 Max. Athletes given only 100% of the RDA for 12 weeks were not able to maintain red blood cell status or increase VO2 Max from progressive training, as did the former. [Colgan et al., 1991]

BIOCHEMISTRY OF MICRONUTRIENT MIGRATION IS DIFFERENT IN INDIVIDUALS

What do I mean by individual differences? For example, those micronutrients which are directly related to HB-Blood status may be depleted rapidly and take many days to many weeks, depending on a multiple of highly specific individual factors. Animal growth requirements for Vitamin C were determined to differ by a factor of "20". Vitamin A growth requirements were found to differ by as much as 40-fold between animals. [Williams 1956, Williams & Deason 1967]

By a series of studies of vitamin C excretion rates, it may be determined what ideal human vitamins needs are but this may vary from person to person. In one such study, one individual assimilated 5000 milligrams with a low excretion rate, while another per-

son had exhibited a large excretion levels from taking only 1000 milligrams, with total variations between athletes differing by a factor of 10 times. [Colgan 1982]

It has been suggested that the average depletion rate from normal serum levels of vitamin C takes approximately 4 weeks fasting to reach "zero" [-0-]. However, no deficiency disease symptoms from Scurvy will occur until at least 16 weeks practice of vitamin C-void food intake, assuming there were no exercise demands. How long would it take a sedentary depleted subject to reload the Vitamin C stores? Answer: it depends on a multiple of the individual differences such as those discussed above, but when in a depleted state, Vitamin C may be absorbed slightly faster than it was lost. The degree of micronutrient depletion may be proportionate and measurable in blood components, lean muscle growth demands, and the overall health response of the individual athlete.

Blood cells normally last from 60-120 days, whereas the entire blood supply is replaced in 90-120 days. Solid cell lean muscle mass lasts longer, but may take up to 180 days to replace or replenish anew. [Colgan 1993] Supplementation of high dose micronutrient levels in optimum daily allowances [ODA] doses did not resolve low hemoglobin, hematocrit, or red blood cell counts in the first 30 days, but did significantly increase all three after 180 days. [Colgan 1986]

MICRONUTRIENTS, vitamins and minerals, once depleted, take time to migrate from the palate to the palace of performance, they are so very slow, but so utterly sure. Neglecting them in the off-season will deplete them when you need them most, when the season suddenly arrives. They're absence then? It is you who will be so slow... ■

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THE Y2K SCARE IS OVER, WHAT NOW?

by Nate Llerandi

I have found with myself, as well as with the athletes I coach, that the coming of the New Year signals the turn of the corner as far as gearing up for the upcoming racing season. The gluttony of the holiday season is behind us, and the early Spring races are coming up quickly. And up to this point, any sort of training is enough to get by. But now athletes begin to look for a little more structure as goals creep to the forefront of their minds. So, what is an athlete to do?

The first thing is to not panic. My mantra is this: "Rome wasn't built in a day, and neither is our fitness." Yet, laying down a well-thought out plan – both in how your training week is structured as well as your overall season of training – can help you maximize your gains in the least amount of time. Based on my own experiences as a national and world class athlete, as well as much research and conversation with top athletes and coaches from various disciplines, I have formulated what I think is an effective weekly plan of attack for this part of the season. This is by no means the only weekly structure that will bring results, but it will work effectively.

This plan will work no matter what sport you participate in. If you are a multi-sport athlete, then you need to pick and choose which disciplines you will do on the various days of the week to balance out the intensity for each. Or even rotate the intensity among the sports each week within every cycle. As always, allow enough time for complete warm ups and cool downs.

■ **Mondays** are either recovery days or days off. This means you keep your workout short and keep your HR below 65%. Lifting weights is a good idea today as well.

■ **Tuesdays** are sprint days. Sprints are all out effort lasting 30 seconds. Recover completely after each sprint, up to 5 minutes. The

goal is to maximize your speed and effort while remaining as relaxed as possible. You can do these on the flats to work on leg speed or uphill to work on power. It is better to do fewer repeats and be completely recovered than to do more sprints when not fully recovered. Complete 6-10 reps.

■ **Wednesdays** are fartlek days, or unstructured interval days. You should keep your HR in the 70-92% range, letting your HR rise and fall within the zone at random. Maybe you push hard on every uphill section and relax the rest of the time, as an example. The majority of this workout is aerobic with brief spikes in intensity. Ultimately, it does not matter how much time you spend at any given level of intensity, so just go out there and enjoy the workout.

■ **Thursdays** are complete aerobic days. Keep your HR between 65-75% for the majority of your workouts today. These workouts can also be a little longer than normal given their lower intensity.

■ **Fridays** are complete recovery days. If you work out, keep your HR below 65%. If you are particularly tired, you can also take the day off.

■ **Saturdays** are basically a repeat of Tuesdays. If sprints are not extremely important to your racing, e.g. if you are a RAAM athlete or triathlete – then you can opt for a repeat of Wednesday's workout instead. Since this is the weekend, duration can be longer.

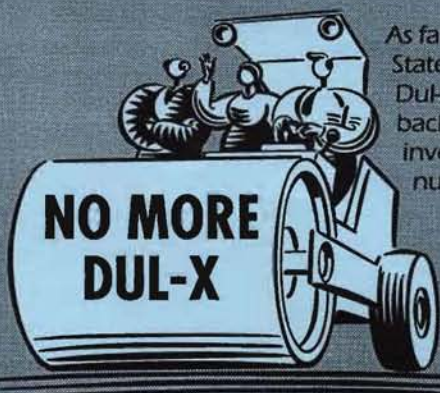
■ **Sundays** are aerobic endurance days, repeats of Thursdays, only longer. Sundays are

the longest workout days. Definitely keep your HR in the 65-75% range, no higher. When going long, harder is definitely not better.

That's essentially it. I used to tout the 4-week cycle – 3 weeks hard, 1 week easy. Now, I believe training cycles need to be 5 or 6 weeks in length. If your body is prone to breaking down easily, then stick with the 4-week cycle. If not, then going hard for 4 or 5 weeks before taking a recovery week will allow you to make gains more quickly. You can even do the longer cycles now and switch to the shorter cycles when your training becomes more intense come summer. Each hard week within a cycle should get slightly longer; the rest week should be roughly 50-60% duration of the longest week in the cycle. Then the first week of the next cycle should be a little longer than the first week of the cycle you just finished. Thus, each week of your second cycle will be a little longer than the same week of your first cycle.

Follow this weekly breakdown for two cycles. This will prepare your body for the more intense training once Spring and Summer come along, but won't overtax you too quickly nor too early. Happy Training! ■

Nate Llerandi is a retired pro triathlete and has been an E-CAPS athlete since 1989. His successful racing career culminated with a ranking of top American and 6th overall in the ITU World Cup Series. Nate now coaches endurance athletes of all walks of life and ability levels. Nate welcomes questions about coaching and training at llerandi3@aol.com.



As far as we can tell, Dul-X products are no longer being imported or sold in the United States. On Monday, February 8th, we received several calls from people asking about Dul-X products and how to reach their distributor. Several of the same people called back to inform us that the numbers we had given were disconnected. Upon further investigation, we found that Dul-X's website was down as well as all of their local numbers and their 800 number.

We have a few units of the Dul-X products left in stock, but once those are gone, that's the end of this product line. In the meantime, we are looking for a replacement, since we think this type of product is beneficial for our customers. We will keep you posted on our search. Of course, if you have a favorite topical warming/cooling/massage type product, please let us know.

PREMIUM INSURANCE CAPS NOW IRON FREE!

In humans, high levels of storage iron as well as low iron binding capacity are considered at-risk for ischemic heart disease progression. The mechanism for this is likely elevated hydroxyl radical production due to an enlarged transit iron pool.

Researchers van Jaarsveld, Kuyt, & Wiid determined whether diet-containing iron concentrations near the recommended upper limit tended to alter the degree of myocardial ischemic/reperfusion injury in rats or whether simultaneous antioxidant supplementation had cardiovascular-debilitating effects. [Res Commun Mol Pathol Pharmacol 1994 Dec;86(3):273-85]

Their results indicate that an iron-supplemented diet increased the degree of oxidative injury while simultaneous antioxidant supplementation prevented much of this increase. This prompted Dr. Bill Misner, Ph.D. to review 16 endurance athletes' and 9 non-endurance athlete's iron intake from their reported food intake in a series of computer-generated Dietary Analysis data he collected over the past 3 years.

The results of his review are as follows:

**AVERAGE MALE ENDURANCE
ATHLETE'S DAILY IRON INTAKE
FROM FOODS**
N=9 AVERAGE=279%

**AVERAGE FEMALE ENDURANCE
ATHLETE'S DAILY IRON INTAKE
FROM FOODS**
N=7 AVERAGE=193%

**AVERAGE MALE NON-ENDURANCE
ATHLETE'S DAILY IRON INTAKE
FROM FOODS**
N=4 AVERAGE=158%

**AVERAGE FEMALE NON-ENDURANCE
ATHLETE'S DAILY IRON INTAKE
FROM FOODS**
N=5 AVERAGE=115%

Male athletes tend to consume more calories therefore their total iron intake from food sources exceeds dramatically their required daily allowance [RDA]. The athletes, whose food intakes I analyzed, tend to ingest nearly double their required daily allowance in iron. This then begs the question as to why we would supplement a mineral above the RDA when it has been determined to be a factor in progressive risks contributing to ischemic heart disease. Supplementing iron when it is super-sufficient within the dietary food choices of athletes should not be included in our multiple vitamin-mineral supplements.

We have therefore removed iron from PREMIUM INSURANCE CAPS. If your physician determines you to be iron-poor, separate supplements may be taken in order to enrich or replenish iron deficiency. This subject is still widely debated among a few sports scientists due to the individual differences in iron status. The high iron intake from over 92% of all diets we examined and the dangers associated to cardiovascular efficiency have resulted in this action. Further references or explication in detail regarding this issue will be provided upon request. ■



MEET OUR NEWEST STAFF MEMBER!

This past October, I finally added a much needed staff member to our team. His name is Dan Taylor, and I have known him since 1993. He is a native of Tucson, Arizona and is a category 2 racer on the road and expert/elite off-road. Dan started and ran a successful grass roots mountain bike team called Fly Racing, and worked as a rep in the bike industry for several years before joining KHS as their marketing coordinator and director of their professional Mountain Bike and Dirt Jumping teams.

Dan has a degree in communications and an extensive background in advertising and mar-

keting as well as graphics and computers. With his able assistance, it is my hope that we will be able to more successfully execute our marketing efforts. I also hope to have more time to concentrate on new product development with Dr. Bill, be more available to talk with customers by phone and e-mail and contribute more to our on-line discussion group. This should mean this newsletter will go out every on schedule every 90 days and we will be keeping in touch with you more regularly with special offers and new product announcements.

Since Dan has used our products for the past six years, he is also very capable of answering product usage related questions. So, if you call our offices and Dan answers the phone, say hello and introduce yourself to him. ■

WHAT'S NEW ON LINE?

I know I don't need to tell you that e-commerce is expanding at an exponential rate. However, I do want to let you know we plan to stay at the forefront of this movement instead of lagging behind or trying to play catch up. Listed below are some of the new and existing on-line services that we currently offer or plan to offer in the near future.

First of all, our old web sites are being scrapped and being replaced with new ones. Our new sites will be easier to navigate, offer much more information and have true secure server "shopping cart" order taking capabilities. They will feature an indexed, searchable database of all of Dr. Bill's answers to your questions, instructions for each and every product, a bio section with information and photos of all of the athletes we sponsor and tons more. Our new web site will also host our Endurance on-line discussion group with an interactive bulletin board.

Dr. Bill has created a new Journal On Endurance (JOE) that will be published every two weeks. JOE is full of interesting and useful information for you to enjoy. This electronic journal will be distributed via e-mail instead of being posted to the endurance chat list. If you are interested in receiving important new developments but don't want to participate in a discussion group, JOE is the perfect solution. To be added to the list of JOE recipients, just sent an e-mail to ecaps@e-caps.com and ask to be subscribed to JOE. Of course you can remove your e-mail address anytime.

We are also building an e-mail database for those of you that would like to receive advance notice of specials and sales as well promotions that will only be offered electronically. If you would like to be a part of this, please send us an e-mail and let us know.

However, we will not share your address with anyone under any circumstances. So you needn't worry about your in-box being filled with spam because you gave us your e-mail address. ■



A RATIONALE FOR TAKING SUPPLEMENTS: ARE WE TAKING TOO MANY?

by Dr. Bill Misner, Ph.D.

Much debate exists over the question of how much is too much in the way of supplements. We could quote many examples of specific athletes such as Steve Born. His legendary ultramarathon cycling achievements appear to justify his supplement intake. Steve's regimen includes taking over 25 supplements plus Sustained Energy and Hammer Gel during a regular regimen of a 6-12 hour cycling effort. We have literally hundreds of others who testify, they could not have done it without such what-appears-to-be excessive supplement dose volume. The fact is if you spend it, you must replenish it quickly or systemic failure will result. Since I chose not to use anecdotal explanations, let me share my rationale for the supplement protocols to which we aspire from some of the shown research listed below.

Through reliable research and trial and error with world-class athletes, we find that the more one pushes their limits in training, the more they tend to deplete necessary nutrients, vitamins, minerals, enzymes, coenzymes, and substrates. Athletes today ingest only 11% of the organic nutrients from their food sources that the athletes of the 1940's enjoyed! Why so little? The soils have been depleted by modern farming techniques; we have lost 89% of what the soils formerly gave to growing crops and livestock feed.

Pesticides and pollutants within the harvested produce have also been observed to interfere with the complete absorption of vital organic substrates. As the athlete ages, no matter how good their inherited genetics, less digestive enzymes are produced (needed for maximal absorption of foods ingested). We are starving and nutrient-deficient, yet we are 33% overweight.

Modern science has concluded that marginal nutritional deficiency and imbalance is directly responsible for 644 diseases or disorders. Credible research from several journals of science named a number of health and performance inhibiting disorders which may be caused by the marginal lack or imbalance of the following micronutrients: boron (3), calcium (31), copper (33), folic acid (37), iodine (6), iron (31), magnesium (47), manganese (14), niacinamide or Niacin (24), pantothenic acid (14), PABA (5), potassium (19), selenium (37), vitamin A (42), vitamin B-1 (19), vitamin B-2 (15), vitamin B-6 (40), vitamin B-12 (35), vitamin C (53), vitamin D (24), vitamin E (59), and zinc (56) or

totally 644 possible performance-inhibiting, deficiency-induced problems, which athletes and non-athletes are experiencing today.

DEFICIENCY CAUSES PREMATURE FATIGUE.

Marginal deficits in any micronutrient may seriously reduce the performance of work. Bates' published work in the prestigious British science journal *Lancet* found that lack of the B-complex vitamins, iron, and vitamin C in developing countries reduced work performance significantly. Boetz confirmed Bates' work showing that a deficiency in folic acid contributed to premature fatigue, which was reversed to no fatigue symptoms by supplementation.

The Fry and Thornton studies showed that a lack of pantothenic acid in the human food chain is directly responsible for tiredness, insomnia, and depression. The Ellis research showed supplementing with vitamin B-12 reduces the fatigue associated with stress or prolonged activity. The Gerster project showed that when vitamin C is only marginally deficient, the working status of an athlete is impaired.

Finch and Niederau, in two separate studies, found that too little or too much iron can cause fatigue and decrease the capacity to perform work activities. Magnesium is required for ATP synthesis, the core-source of energy for muscle fiber contraction. It also plays a vital role in the transportation of potassium to the cell. Snively's research discovered that malaise (a general feeling of discomfort) is the most common symptom when potassium is not transported in sufficient quantities for cellular functions. Friedland also found that muscular weakness is a common symptom of potassium imbalances from endurance exercise stress.

The Bakan showed that the white spots on fingernails associated with zinc deficiency are also accompanied by lethargy, and the increased need for more sleep. Subjects who did not have zinc deficiency required less sleep and showed more energetic behavior. Krotiewski's research showed that after supplementing zinc in those who were found marginally deficient, isokinetic strength and isometric endurance of the leg musculature significantly increased. We have discussed only 12 research studies concerned with the marginal nutrient deficiencies that happen to serious athletes. However, there are 632 more disorders that happen to athletes whose exer-

cise habits and intensity border the extreme.

Nutrient deficiency-induced disorders and diseases are possibly more common than studies of sports science biochemistry may accurately measure.

SOME NEED MORE THAN OTHERS...

That some athletes and individuals need more supplement volume is reliably argued by Colgan, Hausman, Lieberman, Bruning, Romeyn and others in nutritional, biomedical, alternative, and sports medical journal research.

Dr. Mary Romeyn writes: "To understand the role of vitamins and minerals, it helps to understand a little bit about the chemistry of your body. Living organisms rely on highly complex processes to perform and regulate those internal functions that are necessary to maintain life.

Processes are in place to:

- Build the cells that make up your body's structures,
- Meet the separate needs of different types of cells,
- Permit each of these different types of cells to carry out its own specific functions,
- Help maintain cellular structure and performance,
- Alter the type and degree of cellular activity in the face of changing circumstances,
- Communicate and coordinate each cell's activity with the activity of other cells and organs in the body,
- Adjust cellular behavior, as needed, in ways that will permit a coordinated response of the whole organism to its environment,
- Dispose of waste products, and
- Govern the disposal of cells when their job is done.

The scientific term we use to describe this is "homeostasis."

Homeostasis can be defined, then, as the ability of a living organism to maintain its structure and function intact, separate from and invulnerable to the forces of its environment.

(continued on page 7)



The maintenance of homeostasis is highly complex, requiring many series of chemical reactions, distinct and yet interrelated. Each step in each reaction requires the presence of specific substances, often in minute amounts. Homeostasis cannot be maintained if these materials are not present, or are present in too small a quantity.

Vitamins, minerals, and trace elements are among these necessary substances. With the exception of vitamin D, which can be made within the skin, they cannot be made in the body; they must be absorbed to be obtained. Some are produced for us within the gut, by bacteria that live there.

We don't need a lot of them. Given perfect health and a well-balanced diet, we can get what we need from the food we eat. In states of altered metabolism we may need more. During or following an illness, the body's natural processes of healing and repair cannot go forward unless we have enough, sometimes more, of the vitamins required.

There is evidence, which raises the possibility that higher amounts of some of these substances may actually improve our health even when we're not sick, by giving our bodies a richer source of materials to draw from in the face of normal stress. This view is controversial, but more and more research supports it."

Dr. Romeyn is addressing those stricken with a wasting syndrome that accompanies AIDS-HIV. The athlete model also suffers from self-induced wasting during extreme endurance or intense performance depletion. Approximately 10-15% of the caloric wasting occurs from lean muscle mass cannibalization. The other 80-85% of this caloric wasting process comes from burning fat and carbohydrate stores. When such wasting or depletion occurs, the rate of free radical production increases by 12-20 times above sedentary levels. The athlete model is in constant homeostatic imbalance in proportion to caloric depletion expense incurred in relationship to intensity and duration of effort.

If one views supplements as substrate-concentrates which are not presently adequate from the food chain for replenishing the losses basic in depletion-wasting of each from disease, exercise, or stress demands, taking a super-concentrated food sourced tablet, pill, or powder reinstates not only the potency of the food, but also enhances homeostatic balance. How many animal products would one have to eat to replenish at a hyper-rate the Cytochrome C and Coenzyme Q-10 spent from a 2-hour aerobic workout? How many pounds of vegetables, fruits, nuts, seeds, and whole grains would one

have to eat to replenish the body's natural antioxidant stores that were neutralized during an intense interval session or a longer effort on weekend? The Phytomax Supplement presents an example of concentrated food with substrate numbers that support the supplement application:

PHYTOMAX EQUIVALENCY TABLE
(one serving)

CHLOROPHYLL — 5 tossed salads antibacterial ■ wound healing tissue growth
BETA CAROTENE — 1 cup tomato juice (antioxidant) free-radical fighter ■ prevents cancer prevents heart disease
B-VITAMINS — 1 cup spinach (metabolism of carbohydrates) fats and proteins ■ circulation enzyme activity ■ anti-stress red blood cell formation
MAGNESIUM — 1 cup lima beans (prevent heart attacks) cardiovascular system muscle cramp prevention fights depression ■ natural tranquilizer prevents calcium deposits
ZINC — 1 cup green beans (essential for protein synthesis) muscle contraction control formulation of insulin acid-alkaline blood balance DNA synthesis ■ reproductive organs
CALCIUM — 7 glasses milk (strong bones/teeth) heart beat regularity ■ metabolize iron all nerve impulses ■ insomnia relief

After over 12 years of research, experiments, trial and error [many errors], I take 14 PIC's, 2 Race Caps, 4 Enduro Caps, 2-4 Phytomax, 2 Super AO's, 4000 mg Vitamin C, 1200 IU Vitamin E, 2-4 grams Flax Seed Oil, 1-2 grams DHA-EPA Oil, or 3 ZMA's, plus 2 servings of Whey Pro-100 during the days when my workout is either intense or prolonged [2 hours duration]. [That totals 11 separate supplements in 44 units per day!]

I did try it with no supplements, but it didn't work, leaving me less than -5 to -15% slower rate of performance and -30% longer when prolonging duration! Had I not been able to tell the difference objectively on the stopwatch, I would not have continued to participate in such excessive food-concentrate-substrate "supplemental" protocols. ■

Complete references provided upon request.

NEW PILL HOLDERS

A dilemma that most of you who exercise for more than 2 hours at a time is how to carry your various E-CAPS capsules so you can easily get at them when you need them. Whether it is a handful of Endurolytes you carry to combat heat stress or dosages of Race Caps & Enduro Caps, carrying them on the bike or while you are running can be a problem. Especially since many of the capsules look the same. Although many of you have found ways to address this issue, we felt it was incumbent upon us to provide you a better solution.

To help facilitate more convenient transport and access to your pills, we have come up with two solutions. The first one was discovered by Dan Taylor and it is perfect for carrying Endurolytes or up to 17 of any capsules of your choice. It's called a Quick Coin and has been around for decades. This oval shaped soft plastic container has a slit on one side and when you squeeze the ends, the slit opens and the capsules can come out. You can carry them conveniently in a jersey pocket, fanny pack or tucked into the waist band of your shorts or swim suit. For ultra distance events, you could have several of them each containing a quantity of capsules of your choice.

The second solution is far less high tech, but equally handy. We have procured a large quantity of two inch by three inch zip lock baggies with a white panel you can write on. This way you can individually pack each dosage you plan to take in a baggy and mark them 1, 2, 3 and so on. So if you were doing a long event, you could pack 1 Race Cap, 2 Enduro Caps and 3 Endurolytes in each bag and take one baggie every one to two hours.

Best of all, these items are available to you free of charge. Just tell us what you want when you place an order and we'll include them free of charge. You can have as many of the zip lock bags as you want. However, since the Quick Coins cost us about 60 cents each, we will limit each customer to three. Of course, if you want more, we'll be happy to sell them to you at our cost.

We hope these ideas will help make carrying and taking your supplements easier. However, we are always looking for easier and more convenient solutions, so if you have any ideas, feel free to let us know. ■



By Mark Gold

These excerpts from Mark Gold's original article against dietary applications of aspartame are reprinted by permission of Mr. Gold.

THE BITTER TRUTH ABOUT ASPARTAME

[Aspartame sugar substitutes cause worrying symptoms from memory loss to brain tumors. But despite US FDA approval as a 'safe' food additive, aspartame is one of the most dangerous substances ever to be foisted upon an unsuspecting public.]

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"THE BITTER TRUTH ABOUT ASPARTAME"

EXCERPTS FROM AN UPDATED REVIEW OF DIETARY ASPARTAME By Mark Gold

ASPARTAME is made up of three chemicals:

- [A] 40% Aspartic acid
- [B] 50% Phenylalanine
- [C] 10% Methanol

ASPARTIC ACID (40% OF ASPARTAME)

Dr Russell L. Blaylock, a professor of Neurosurgery at the Medical University of Mississippi, recently published a book thoroughly detailing the damage that is caused by the ingestion of excessive aspartic acid from aspartame. [Ninety nine percent of monosodium glutamate (MSG) is glutamic acid. The damage it causes is also documented in Blaylock's book.] Blaylock makes use of almost 500 scientific references to show how excess free excitatory amino acids such as aspartic acid and glutamic acid in our food supply are causing serious chronic neurological disorders and a myriad of other acute symptoms. (3)

Aspartate and glutamate act as neurotransmitters in the brain by facilitating the transmission of information from neuron to neuron. Too much aspartate or glutamate in the brain kills certain neurons by allowing the influx of too much calcium into the cells. This in-

flux triggers excessive amounts of free radicals that kill the cells. The neural cell damage that can be caused by excessive aspartate and glutamate is why they are referred to as "excitotoxins." They "excite" or stimulate the neural cells to death.

Aspartic acid is an amino acid. Taken in its free form (unbound to proteins) it significantly raises the blood plasma level of aspartate and glutamate. The excess aspartate and glutamate in the blood plasma shortly after ingesting aspartame or products with free glutamic acid (glutamate precursor) leads to a high level of those neurotransmitters in certain areas of the brain.

The blood brain barrier (BBB) which normally protects the brain from excess glutamate and aspartate as well as toxins 1) is not fully developed during childhood, 2) does not fully protect all areas of the brain, 3) is damaged by numerous chronic and acute conditions, and 4) allows seepage of excess glutamate and aspartate into the brain even when intact.

The excess glutamate and aspartate slowly begin to destroy neurons. The large majority (75%+) of neural cells in a particular area of the brain are killed before any clinical symptoms of a chronic illness are noticed. A few of the many chronic illnesses that have been shown to be contributed to by long-term exposure excitatory amino acid damage include:

Multiple Sclerosis (MS), ALS, memory loss, hormonal problems, hearing loss, epilepsy, Alzheimer's disease, Parkinson's disease, hypoglycemia, AIDS dementia, brain lesions, and neuroendocrine disorders.

The risk to infants, children, pregnant women, the elderly, and persons with certain chronic health problems from excitotoxins is great. Even the Federation of American Societies For Experimental Biology (FASEB), which usually understates problems and mimics the FDA party-line, recently stated in a review, "it is prudent to avoid the use of dietary supplements of L-glutamic acid by pregnant women, infants, and children. The existence

of evidence of potential endocrine responses, (i.e., elevated cortisol and prolactin, and differential responses between males and females), would also suggest a neuroendocrine link and that supplemental L-glutamic acid should be avoided by women of childbearing age and individuals with affective disorders." (4) Aspartic acid from aspartame has the same deleterious effects on the body as glutamic acid.

The exact mechanism of acute reactions to excess free glutamate and aspartate is currently being debated. As reported to the FDA, those reactions include: (5) Headaches/migraines, nausea, abdominal pains, fatigue (blocks sufficient glucose entry into brain), sleep problems, vision problems, anxiety attacks, depression, and asthma/chest tightness.

One common complaint of persons suffering from the effect of aspartame is memory loss. Ironically, in 1987, G.D. Searle, the manufacturer of aspartame, undertook a search for a drug to combat memory loss caused by excitatory amino acid damage. Blaylock is one of many scientists and physicians who are concerned about excitatory amino acid damage caused by ingestion of aspartame and MSG. A few of the many experts who have spoken out against the damage being caused by aspartate and glutamate include Adrienne Samuels, Ph.D., an experimental psychologist specializing in research design. Another is Olney, a professor in the department of psychiatry, School of Medicine, Washington University, a neuroscientist and researcher, and one of the world's foremost authorities on excitotoxins. (He informed Searle in 1971 that aspartic acid caused holes in the brain of mice.) Also included is Francis J. Waickman, M.D., a recipient of the Rinkel and Forman Awards, and Board certified in Pediatrics, Allergy, and Immunology.

Other concerned scientists include: John R. Hain, M.D., Board Certified Forensic Pathologist, and H.J. Roberts, M.D., FACP, FCCP, Diabetic Specialist, and selected by a national medical publication as "The Best Doctor in the US."

John Samuels is concerned, also. He compiled a list of scientific research sufficient to show the dangers of ingesting excess free glutamic and aspartic acid.

And there are many more that can be added to this long list.

ASPARTIC ACID [An Amino Acid] REVIEW (5-a)

Aspartic acid, readily available in protein

(continued on page 9)

foods, is very active in many body processes, including the formation of ammonia and urea and their disposal from the body. It is found in high levels throughout the human body, especially in the brain, where it performs an excitatory function. Aspartic acid has been found in increased levels in people with epilepsy and in decreased amounts in some cases of depression. Aspartic acid also can help form the ribonucleotides that assist production of DNA and RNA and aids energy production from carbohydrate metabolism.

Aspartic acid can help protect the liver from some drug toxicity and the body from radiation; it may also increase resistance to fatigue. Aspartic acid is employed to form mineral salts, such as potassium, calcium, or magnesium aspartate. Since aspartates are easily absorbed, they can actively transport these minerals across the intestinal lining into the blood and cells where they can be used for their particular functions, such as energy production or bone metabolism.

Asparagine, formed from aspartic acid, aids the metabolic function of the cells of the brain and nervous system by releasing energy as it reverts back to aspartic acid.

Clinically, aspartic acid may be used to treat fatigue or depression. Its effect on the thymus gland lets it be used as a mild immunostimulant. A current popular use is in the sweetener, aspartame (see Chapter 11, Environmental Aspects of Nutrition), which is a combination of aspartic acid and phenylalanine. Aspartic acid is basically nontoxic."

PHENYLALANINE (50% OF ASPARTAME)

Phenylalanine is an amino acid normally found in the brain. Persons with the genetic disorder, phenylketonuria (PKU) cannot metabolize phenylalanine. This leads to dangerously high levels of phenylalanine in the brain (sometimes lethal). It has been shown that ingesting aspartame, especially along with carbohydrates can lead to excess levels of phenylalanine in the brain even in persons who do not have PKU. This is not just a theory, as many people who have eaten large amounts of aspartame over a long period of time and do not have PKU have been shown to have excessive levels of phenylalanine in the blood. Excessive levels of phenylalanine in the brain can cause the levels of serotonin in the brain to decrease, leading to emotional disorders such as depression. It was shown in human testing that phenylalanine levels of the blood were increased significantly in human subjects who chronically used aspartame. (6) Even a single use of aspartame raised the

blood phenylalanine levels.

In his testimony before the US Congress, Dr. Louis J. Elsas showed that high blood phenylalanine can be concentrated in parts of the brain, and is especially dangerous for infants and fetuses. He also showed that phenylalanine is metabolized much more efficiently by rodents than by humans. (7)

One account of a case of extremely high phenylalanine levels caused by aspartame was recently published in the "Wednesday Journal" in an article entitled "An Aspartame Nightmare." John Cook began drinking 6 to 8 diet drinks every day. His symptoms started out as memory loss and frequent headaches. He began to crave more aspartame-sweetened drinks. His condition deteriorated so much that he experienced wide mood swings and violent rages. Even though he did not suffer from PKU, a blood test revealed a phenylalanine level of 80 mg/dl. He also showed abnormal brain function and brain damage. After he kicked his aspartame habit, his symptoms improved dramatically. (8)

As Blaylock points out in his book, early studies measuring phenylalanine buildup in the brain were flawed. Investigators who measured specific brain regions and not the average throughout the brain notice significant rises in phenylalanine levels. Specifically the hypothalamus, medulla oblongata, and corpus striatum areas of the brain had the largest increases in phenylalanine. Blaylock goes on to point out that excessive buildup of phenylalanine in the brain can cause schizophrenia or make one more susceptible to seizures.

Therefore, long-term, excessive use of aspartame may provide a boost to sales of serotonin re-uptake inhibitors such as Prozac and drugs to control schizophrenia and seizures.

METHANOL (AKA WOOD ALCOHOL/POISON) (10% OF ASPARTAME)

Methanol/wood alcohol is a deadly poison. Some people may remember methanol as the poison that has caused some "skid row" alcoholics to end up blind or dead. Methanol is gradually released in the small intestine when the methyl group of aspartame encounters the enzyme chymotrypsin.

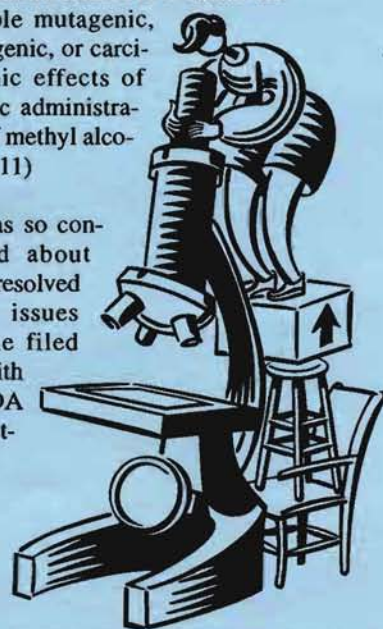
The absorption of methanol into the body is sped up considerably when free methanol is ingested. Free methanol is created from aspartame when it is heated to above 86 Fahrenheit (30 Centigrade). This would occur when aspartame-containing product is improperly stored or when it is heated (e.g., as part of a "food" product such as Jell-O).

Methanol breaks down into formic acid and formaldehyde in the body. Formaldehyde is a deadly neurotoxin. An EPA assessment of methanol states that methanol "is considered a cumulative poison due to the low rate of excretion once it is absorbed. In the body, methanol is oxidized to formaldehyde and formic acid; both of these metabolites are toxic." The recommended limit of consumption of 7.8 mg/day. A one-liter (approx. 1 quart) aspartame-sweetened beverage contains about 56 mg of methanol. Heavy users of aspartame-containing products consume as much as 250 mg of methanol daily or 32 times the EPA limit. (9)

Symptoms from methanol poisoning include headaches, ear buzzing, dizziness, nausea, gastrointestinal disturbances, weakness, vertigo, chills, memory lapses, numbness and shooting pains in the extremities, behavioral disturbances, and neuritis. The most well known problems from methanol poisoning are vision problems including misty vision, progressive contraction of visual fields, blurring of vision, obscuration of vision, retinal damage, and blindness. Formaldehyde is a known carcinogen, causes retinal damage, interferes with DNA replication and causes birth defects. (10) Due to the lack of a couple of key enzymes, humans are many times more sensitive to the toxic effects of methanol than animals. Therefore, tests of aspartame or methanol on animals do not accurately reflect the danger for humans. As pointed out by Dr. Woodrow C. Monte, Director of the Food Science and Nutrition Laboratory at Arizona State University, "There are no human or mammalian studies to evaluate the

possible mutagenic, teratogenic, or carcinogenic effects of chronic administration of methyl alcohol." (11)

He was so concerned about the unresolved safety issues that he filed suit with the FDA requesting a



(continued on page 10)

hearing to address these issues. He asked the FDA to "slow down on this soft drink issue long enough to answer some of the important questions. It's not fair that you are leaving the full burden of proof on the few of us who are concerned and have such limited resources.

You must remember you are the American public's last defense. Once you allow usage (of aspartame) there is literally nothing my colleague or I can do to reverse the course. Aspartame will join saccharin, the sulfating agents, and God knows how many other questionable compounds enjoined to insult the human constitution with governmental approval." (10) Shortly thereafter, the Commissioner of the FDA, Arthur Hull Hayes, Jr., approved the use of aspartame in carbonated beverages, he then left for a position with G.D. Searle's Public Relations firm. (11)

It has been pointed out that some fruit juices and alcoholic beverages contain small amounts of methanol. It is important to remember, however, that methanol never appears alone. In every case, ethanol is present, usually in much higher amounts. Ethanol is an antidote for methanol toxicity in humans (9). The troops of Desert Storm were "treated" to large amounts of aspartame-sweetened beverages, which had been heated to over 86° F. in the Saudi Arabian sun. Many of them returned home with numerous disorders similar to what has been seen in persons who have been chemically poisoned by formaldehyde. The free methanol in the beverages may have been a contributing factor in these illnesses. Other breakdown products of aspartame such as DKP (discussed below) may also have been a factor.

In a 1993 act that can only be described as "unconscionable," the FDA approved aspartame as an ingredient in numerous food items that would always be heated to above 86° F. (30° C.).

DIKETOPIPERAZINE (DKP)

DKP is a by-product of aspartame metabolism. DKP has been implicated in the occurrence of brain tumors. Olney noticed that DKP, when nitrosated in the gut, produced a compound which was similar to N-nitrosourea, a powerful brain tumor-causing chemical. Some authors have said that DKP is produced after aspartame ingestion. I am not sure if that is correct. It is definitely true that DKP is formed in liquid aspartame-containing products during prolonged storage.

G.D. Searle conducted animal experiments on the safety of DKP. The FDA found numer-

ous experimental errors occurred, including "clerical errors, mixed-up animals, animals not getting drugs they were supposed to get, pathological specimens lost because of improper handling," and many other errors. (12) These sloppy laboratory procedures may explain why both the test and control animals had sixteen times more brain tumors than would be expected in experiments of this length.

In an ironic twist, shortly after these experimental errors were discovered, the FDA used guidelines recommend by G.D. Searle to develop the Industry-wide FDA standards for Good Laboratory Practices. (11)

DKP has also been implicated as a cause of uterine polyps and changes in blood cholesterol by FDA Toxicologist Dr Jacqueline Verrett in her testimony before the US Senate. (13) ■

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Special Thanks to Mr. Mark Gold for allowing us to reprint portions of his material: FULL UPDATED ARTICLE FROM MARK GOLD* @: www.trufax.org/reports4/aspartam.html *Recently updated with new but heavily-referenced scientific FAQs may also be found at:

www.holisticmed.com/aspartame/abuse/
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MORE E-CAPS MOMENTS

Following are race results we missed in our last newsletter, sorry!

DEBORAH BOLLIG

11/99 Helen Klein 50 mile road race - 1st female National 50 mile Championships *course record

The following athletes who use E-CAPS/Hammer Nutrition products were listed in the February 2000 issue of "Inside Triathlon" as 1999 All Americans. Good job and keep on hammerin'.

TRIATHLON

Women: Allison Hardy, Jennifer Samuels, Bodil Arlander, Rachel Portner, Barb Morgan, Marge Stahl

Men: Jeff Cuddeback, Kevin Moats, Tony Schiller, Tom MacNiven, Scott Bulfinch, Jim Donaldson, Ed LeTourneau, Jon Adamson, Jerry Kenney, Cliff Rigsbee

DUATHLON

Men: - Scot Bulfinch, Bill Riley

Congratulations to everyone that was listed and hope to see you there next year!!! ■

to raising extracellular phosphate levels. Intra cellular phosphate is involved in the regulation of energy metabolism and endurance performance in a number of ways: (Kreider 1998) (1) Increases the rate of ATP production (2) Increases mitochondrion-enzyme activity (3) Increases Creatine Phosphate resynthesis process (4) Enhances Acid-Base balance during exercise (5) Increases cardiac muscle contractility-response to exercise (6) Stimulates glycolysis and energy metabolism (7) May enhance physiological responses to exercise. Research suggests Glutamine elevates growth hormone levels by up to 420% and enhances muscle glycogen stores.

DIGEST CAPS

"Get the most out of everything you eat."

Your ability to absorb and assimilate the nutrients you eat is essential to your performance. DIGEST CAPS is a potent mix of key probiotics – "good" bacterial microorganisms. These microorganisms flourish in your small intestine and are a major factor in digestion. Without these "friendly bacteria" your assimilation of nutrients would be seriously hindered. Most people do not have sufficient quantities of probiotics in their system due to inadequate food sources, antibiotic use and a myriad of environmental factors. The organisms found in DIGEST CAPS (*L. acidophilus*, *B. bifidum*, and *B. longum*) are exactly the ones needed in your system. Nutritionists have touted the ingredients of DIGEST CAPS for:

- Enhanced digestion
- Lower cholesterol levels
- Enhanced immune system response
- Increased absorption of key performance enhancing vitamins and minerals

Endurance athletes are dependent upon efficient digestion and assimilation of nutrients both during training and competition. A balance of "Good" bacterial microorganisms has been shown to enhance: (1) Digestion, (2) Cholesterol Levels, (3) Immune System Response, and (4) Vitamin and Mineral Absorption Rates. Good gastric bacterial balance promotes overall health and helps digest proteins by a process in which lactic acid, hydrogen peroxide, enzymes and antibiotic substances inhibit pathogenic microorganisms. "Friendly bacteria" synthesize many important vitamins in the digestive tract including Vitamin K and some of the B vitamins. A very important function they perform is helping the colon maintain a proper pH or acid-base balance. It is necessary for the pH to stay in the correct range in order for other health supporting bacteria to exist.



OMEGASOURCE

"Top off your performance with long-term health."

Essential Fatty Acids (EFAs) are critical for every day health and longevity as well as achieving peak athletic performance. Unfortunately, most athletes do not get nearly enough EFAs in their regular diet. In fact, we've NEVER done a dietary analysis on an athlete and found adequate EFAs present in their diet. OMEGASOURCE provides you with a perfect ratio of Omega 3 and Omega 6 fatty acids. Nutritionists report that supplementation with the proper ratio and amount of EFAs can result in the following benefits:

- More efficient energy production
- Improved insulin metabolism
- Improved fat burning
- Improved immune response
- Lower cholesterol and triglyceride levels
- Improved hormonal regulation

There are about 50 essential elements our bodies require for every day health and longevity. Most are vitamins, minerals and amino acids, but two are the essential fatty acids known as Omega 3 and Omega 6. The six components of this potent blend of essential fatty acids and vitamin-rich oils create a one-stop nutritional powerhouse that makes long term EFA supplementation simple.

The therapeutic and nutritional oils that make up OMEGASOURCE provide the optimum ratio of Omega 3 to Omega 6 (1:3) for long-term metabolic absorption and uptake. The oils are blended in a complementary ratio that matches the body's specific lipid needs. This strategic nutritional feature is the key to maximum lipid utilization and benefit. ■

45. Sugar leads to decreased glucose tolerance.
46. Sugar can decrease growth hormone.
47. Sugar can increase total cholesterol.
48. Sugar can increase systolic blood pressure.
49. Sugar can change the structure of protein causing interference with protein absorption.
50. Sugar causes food allergies.
51. Sugar can contribute to diabetes.
52. Sugar can cause toxemia during pregnancy.
53. Sugar can contribute to eczema in children.
54. Sugar can cause cardiovascular disease.
55. Sugar can impair the structure of DNA.
56. Sugar can cause cataracts.
57. Sugar can cause emphysema.
58. Sugar can cause atherosclerosis.
59. Sugar can cause free radical formation in the bloodstream.
60. Sugar lowers the enzymes' ability to function.
61. Sugar can cause loss of tissue elasticity and function.
62. Sugar can cause liver cells to divide, increasing the size of the liver.
63. Sugar can increase the amount of fat in the liver.
64. Sugar can increase kidney size and produce pathological changes in the kidney.
65. Sugar can overstress the pancreas, causing damage.
66. Sugar can increase the body's fluid retention.
67. Sugar can cause constipation.
68. Sugar can cause myopia (nearsightedness).
69. Sugar can compromise the lining of the capillaries.
70. Sugar can cause hypertension.
71. Sugar can cause headaches, including migraines.
72. Sugar can cause an increase in delta, alpha and theta brain waves, which can alter the mind's ability to think clearly.
73. Sugar can cause depression.
74. Sugar can increase insulin responses in those consuming high-sugar diets compared to low sugar diets.
75. Sugar increases bacterial fermentation in the colon.
76. Sugar can cause hormonal imbalance.
77. Sugar can increase blood platelet adhesiveness, which increases risk of blood clots.
78. Sugar increases the risk of Alzheimer's Disease.

The complete bibliography will be gladly provided upon request. This article will also be posted on our web site in the near future. ■

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