

ENDURANCE

NEWS

BY HAMMER NUTRITION

#119 April/May 2020

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IN THIS ISSUE...

Quercetin

New research will warm your heart

Fat in the human diet

Dr. Bayne French explores the fats we eat

PLUS...

- The Perils of Loading: **DON'T DO IT**
- Spotlight: **NEW ChitoLean binds fat**





GLORIOUS WEATHER AND TRAILS SHAPED WITH PRECISION

is how **Naomi Haverlick** described her single day trip to Hakuba Iwatake Mountain Bike Park in Japan. Being a light traveler, she only brought the essentials: her bike and her Hammer Kit made by Voler,

“I wouldn’t ever be found on a bike without it.”

Photo: Jared Vigil



Welcome to the 119th issue of Endurance News!

Ready or not, spring is here, which means it's cramping season. More on that shortly, but in the meantime, we've put together another wing ding of an issue for your reading enjoyment! Like so many issues over the past 27 years, this one is chock-full of informative, encouraging, and invigorating content supplied by you and lovingly crafted by our amazing staff into the publication you hold in your hands.

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If you identify with our grass roots, client focused, transparent business model, whether you've been a Hammer supporter for thirty years or thirty days, I am here to ask for your help. Tell your family and friends about us. Whether they are hardcore endurance athletes or not, we have products they need (*think CBD*), and we'd love to be able to help them as we have helped you. Our Win/Win/Win referral program is a perfect vehicle for this. All you have to do is get in and drive it!

Spring cramps – April and May are the months when we get the most calls from clients reporting mysterious cramps occurring during or after their workouts. Most of these calls come from the northern states where it actually gets cold in the winter! There is a straightforward explanation and an easy way to avoid falling prey to this phenomenon. The scenario related to us is the same; a caller states, *"It was the first nice, warm spring day, so I decided to go for a long workout – only to have it end in cramps because I did not compensate for my lack of heat stress acclimatization by taking extra Endurolytes during and after."*

CBD – It's amazing to realize that we are already in our third year of offering this amazing product to you. Unfortunately, in that time, we have seen a proliferation of the wild west; countless shady operators making ridiculous claims while charging ridiculous prices for products of dubious or unknown quality. However, Hammer is still your beacon in the storm. You can count on us to cut through the hype and inflated prices to give you honest-to-goodness products at a fair price.

Speaking of price, it's pretty simple math. Take the price and divide it by the total milligrams in the bottle to determine the per milligram price. 250 mg tincture for \$24.95 is \$0.10/milligram. Some of our CBD products cost as little as \$0.06 per mg, and you know you can trust the quality.

ChitoLean - I think it's kind of ironic that our first new product of 2020 is a fat blocker, when the high fat "keto" diet craze is sweeping the nation and has many converts reading this now. Which, I will suggest, is a good thing because it makes you stop eating sugar! However, when you are forbidden to eat broccoli and zucchini, you've lost me, but I digress.

First, you should know that I have used—and we have anecdotally tested—ChitoLean's primary ingredient, a marine crustacean-derived fat blocker, on and off since the late 90's. Second, calorie type is important, whether you choose to eat fat, carbs (*which kind!*), or protein; but total daily calorie intake trumps everything when it comes to weight loss and reduction in body fat levels. Since fat provides 9 calories per gram, instead of the meager 4 calories per gram provided by carbs and protein, it's an obvious target when weight loss is desired. Chitosan, aka ChitoLean, blocks roughly 20 times its weight in fat. So, if you consume one gram of ChitoLean, you can reasonably expect that 10 grams of fat, 90 calories, will be prevented from being digested and absorbed. If I was going to eat a cheeseburger and french fries, I would take two ChitoLean and two Phytolean, knowing that roughly 180 fat calories and 600 starch calories would not be absorbed or stored as fat. Unless you are a die-hard keto practitioner, this is a product you will likely want to check out.

Before signing off, I want to point you to an article that was in the last issue of Endurance News as well. Yes, it's that important. I am referring to the **loading article found on page 12**. However, this time I did not forget the side bar about the one truly effective way of loading water.

Enjoy the read and pass this on to a friend or two. -Brian

Brian Frank

ENDURANCE NEWS

The informed athlete's advantage since 1993

AN EXCLUSIVE PUBLICATION OF:



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MISSION

Endurance News provides informative and inspirational content to help endurance athletes like you achieve peak performance and health. The views expressed favor a healthy diet, hard training that emphasizes quality over quantity, and prudent supplementation to improve health and performance. Back issues are available at hammernutrition.com.

OUR GUIDING PRINCIPLES

Service: From day one, we've strived to treat each client fairly, honestly, and individually. Your trust is our top priority.

Education: We educate and empower athletes with free, easily accessible information on health and performance.

Principles Before Profits: Profits never take priority over our values. If it says "Hammer Nutrition," it's good for you.

OUR CORE VALUES

Innovation: Our development of new, cutting-edge products and categories has led the field since 1987.

Product Integrity: Our consumables are researched, tested, and USA-made to the strictest standards.

Read our complete mission statement online at hammernutrition.com/company/mission-statement



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In this issue, learn how vitamins and minerals keep your body functioning.

Read more on pages
16, 24, 28, 38, and 40

Scott Mooney shredding the trails at Grand Targhee Montana Enduro Series taking 3rd for Pro Male.
Photo: Jason O'Neil

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ON THE COVER: Lucas Almeida placed 6th AG at Ironman Cozumel decked out in Hammer Gear. Fueled with HEED, Perpetuem, Hammer Gels, and Perpetuem Solids, plus Endurolytes Extreme every 45-60 mins. Photo: Finisher Pix® In February, Lucas had a chance to visit Hammer HQ and pose with a draft of EN119. (right)



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Bind and block the fat. Lose the weight. Discover the benefits of our brand new, triple-nutrient **ChitoLean** formula.



Test your strength and stamina at **The Sisters Stampede XC**, the largest single day mountain bike event in Oregon. Experience the rolling singletrack of Central Oregon lava rock with a start/finish steps away from Three Creeks Brewing in Sisters, OR. **Learn more on page 50.**

A LETTER FROM TOM MILLER



I'M WRITING TO SAY THANK YOU

“ I learned much, if not all, of what I know about endurance fueling from Hammer Nutrition. ”

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DEAR HAMMER NUTRITION,

Hello from Tom Miller, your Endurance News “Cover Boy” from back in 2010!!! WHOA! Time sure does fly, doesn't it???

I want to send you folks a quick note, share how I'm doing, and say thank you for kick-starting what's been a wonderful journey of self-discovery through cycling.

Since I was on the cover, I've continued to cycle avidly, averaging over 10,000 miles per year for the last seven years. I've won a Colorado State Criterium Championship along the way, traveled to events and camps around the U.S. and internationally, and have done countless fun group rides with friends.

THANK YOU

for kick-starting what's been a wonderful journey of self discovery...

I've also been heavily involved in the Colorado Triple Crown endurance series put on by the Rocky Mountain Cycling Club. The Colorado Triple Crown is composed of some of the nation's most challenging double centuries, minimally-supported rides of 200+ miles with between 15,000 and 25,000 feet of elevation gain. Most Triple Crown rides take between 15 and 19 hours to complete. This summer, I'm going for my 10th consecutive Triple Crown. It's something that hasn't been done yet, mainly because most riders have the sense to step away from the series after a few years! And I have to admit, I may dial it back a bit after this year. But who knows?

I'm not the belle of the ball, and there are many, many cyclists out there who are faster than I am, but I truly love the mental and physical challenge that endurance cycling presents and the things I've learned about myself along the way.

I love the mindfulness aspect of endurance cycling—understanding how the limbic system responds to stress and how to quiet the mind's natural, impulsive response to discomfort. I often think of long

endurance rides as having a conversation with the parts of yourself that you really like, the parts that say “I can” and “I will.”

Also, I have to admit that, as a card-carrying introvert, having 15-20 hours of “alone time” on the bike to think and let my mind wander where it may be invaluable to me.



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HOW TO HAMMER

Endurance Fuels and Supplements Product Manual

The **HOW TO HAMMER Product Usage Manual** is a handy resource that supplies all the vital information you need to use Hammer Nutrition products for maximum benefit. This is the final word on usage with all the advanced details and specific applications you need to *Hammer* to the next level.

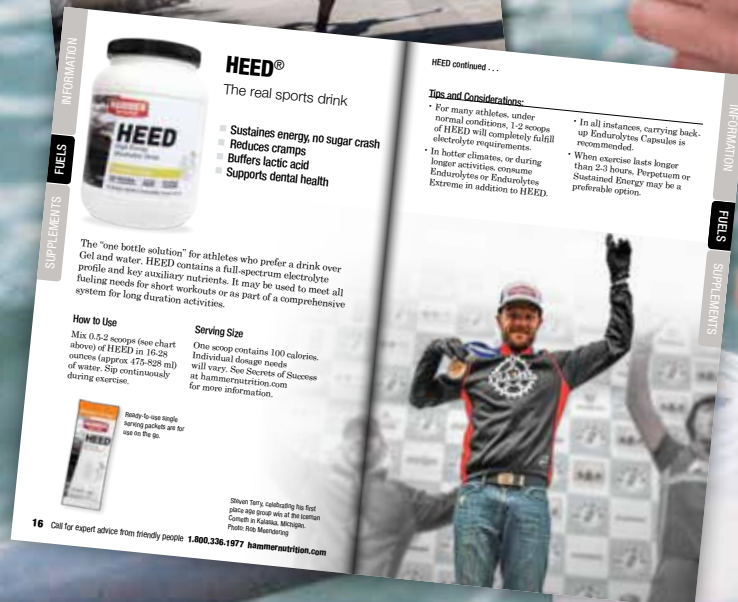
“I’ve continued to use what I’ve learned from you in all the rides I’ve done since.”

Most of the reason I’m writing is not, however, to talk about what I’ve achieved. I’m content to be “just another rider” out there, doing what I can and having fun.

I learned much, if not all, of what I know about endurance fueling from Hammer Nutrition. I spent a long weekend with you in 2010, riding the High-line Hammer (the longest ride I’d done at the time) and learning about proper pre-, during-, and post-ride fueling from the amazing Steve Born and your other experts. I’ve continued to use what I’ve learned from you in all the rides I’ve done since. In fact, I’ve used your products, primarily **Perpetuem**, **HEED**, and **Endurolytes**, on every endurance ride I’ve done.

Cheers!

Tom Miller



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 nickyow • Follow ⋮



❤️ 💬 📍 🔖

Nick Yow:
Chilling and much needed recovery now after a swim-run session. It's been a big week for me with 40-50% increase from last week. Much needed couple days of easy recovery... and push again! [@powerman.my](#) I'm coming...

 bbehul • Follow ⋮



❤️ 💬 📍 🔖

Brano Behul: Getting ready for the weekend! I needed some food which can be eaten even in subfreezing temperatures and I found the perfect product! **Perpetuem Solids**. I froze it to -18° Celsius and it was soft and easy to eat directly after taking it out of the freezer.

 danny_emc_diesel • Follow ⋮



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Daniel Holanda: Florida Polytechnic TT Series 2020

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Marci Pearson: I'm trying. And that's enough.

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RACE RECIPE

BENJAMIN LUSTGARTEN

Professional Nordic Ski Racer for Craftsbury Green Racing Project



Focused on the 2020 World Cup Finals in Canada, Vermont-based racer **Ben Lustgarten** trains year-round on the bike and on his cross country skis in order to compete in the US & Canadian SuperTour and select European World Cup events.

“Work hard, be patient, stay humble, keep a positive mindset, and never give up. Life rarely gives you what you need right when you need it, you must learn to work with what you have in the moment.” - Ben Photo: Gary Solow

FUELING RECIPE

PRE-RACE

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DURING

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Endurolytes® Extreme Powder
Hammer Gel®

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Premium Insurance Caps

RESULTS

- 1st OA • 15km skate** Canadian NorAm / US SuperTour
- 1st OA • 10km skate** US SuperTour
- 1st OA • 15km classic** US SuperTour
- 3rd OA • 10km classic** Canadian NorAm / US SuperTour
- 6th OA • 30km classic** US National Championships

BERNADETTE BENSON

A Decade of National Records

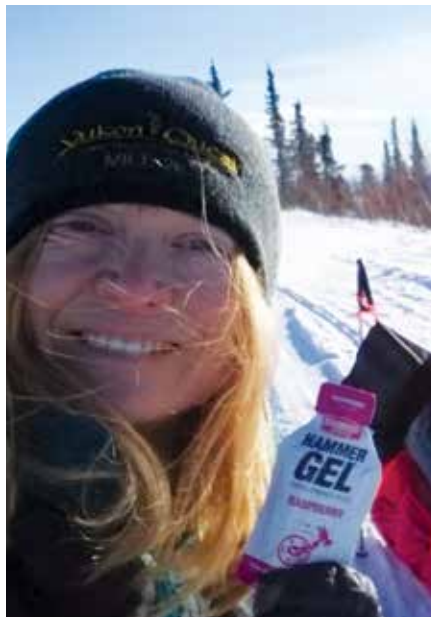
On the eve of her first 24-hour race, Bernadette Benson decided to break the golden rule of fueling. She had taken up distance running four years earlier in 2006. In the early 2000's, all she did was jog around the neighborhood, grinding out three or four miles, three times a week, motivated by a reward of one beer per mile. She trialed a smorgasbord of sugary chews, sugary drinks, and solid foods such as almonds and dates to fuel longer and longer distances.



Photo: Rolf Schatzmann

But for that first 24-hour race, Bernadette picked up a tub of **Orange-Vanilla Perpetuem**, despite never having used it during training. Perpetuem was her sole fuel as she conquered the 2010 Sri Chinmoy 24-Hour National Championship. She won the race after running 200.886K with no stomach distress! Afterward, she shot a quick email to the generic Hammer Nutrition contact.

Steve Born received her email and typed out a lengthy response filled with tips to help her master fueling and recovery. One tidbit Steve mentioned was that she could include some solid food like whole fruit into her fueling plan. Bernadette landed on Perpetuem and (peeled) pears, and she follows those recommendations to this day!



A solo expedition following the Yukon Quest route.

Winning her first 24-hour race was the beginning of many more accolades. Over the past decade, Bernadette has competed across the globe in Australia, Canada, Asia, and Europe. Her successes include:

2014 Australian Female Ultrarunner of the Year

Bibbulmun Track (1,000km) FKT

Australian Open Records: 100-mile (15:24:44), 200K (19:58:31), 12-hour (133.535K), and 24-hour (238.261K)

Canadian Open Records: 6-hour (74.930K), 12-hour (133.535K), and 24-hour (238.261K)

11 Australian Age Group Records

11 Canadian Age Group Records

2019 Helen Stanger Award

When asked about her advice for aspiring ultrarunners, Bernadette immediately turned her attention to taking care of one's body.

"Do not ignore niggles! Get lots of advice, but make sure it's good advice. Don't get advice from your mates just because they are there. They have great intentions, but they're not experts. Also, the cost of a physio trip is worth it in prevention. Don't forget about the cost on your mental state. Get lots of good advice, ask lots of questions."



Tenerife Bluetrail; 3rd OA, 1st AG. Photo: Santiago Ferrero

Why is taking care of her body so important to her? Because once she mastered it, she stopped getting injured. Bernadette hasn't missed a day due to injury since 2011. She credits much of that consistency to mastering her recovery and nutrition.

Fortunately, Bernadette doesn't run with the idea that one mile equals one beer anymore. The transition to better recovery and a healthy life came gradually, bit by bit.

"The better I ate and the more I learned, the better I performed. When I finished runs, I prioritized healthy recovery, which filled me up instead of a beer."

It's been a 20-year journey toward a healthy, whole foods diet with lots of leafy green vegetables and legumes. And Hammer Nutrition products like **Organic Vegan Recoverite**, **Mito Caps**, and **Race Caps Supreme** are cornerstones of her healthy lifestyle.

The year 2020 will be another year of long races and record chasing for Bernadette. She'll compete in the Sri Chinmoy 24-Hour Track race in Australia, the EMU 6-Day Ultramarathon in Hungary, and the World 100K Championships in the Netherlands. For every race, she'll use **Perpetuem**, **Endurolytes**, **Fully Charged**, **Anti-Fatigue Caps**, and **Organic Vegan Recoverite** as she chases championships. **EN**

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Hammer sponsored athlete **Steven Terry** powering through the Mogollon Monster in Arizona. Photo: Jubilee Paige

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LISTEN UP!

The Perils of Loading

BY BRIAN FRANK



“THE IDEA OF ‘LOADING’ ANYTHING IN THE DAYS PRIOR TO A BIG EVENT IS NOT ONLY OUTDATED BUT COMPLETELY COUNTERPRODUCTIVE.”

When you have a big event, competition, or adventure **DO NOT** attempt to:

- X** Load carbohydrates
- X** Load water
- X** Load sodium

IT DOES NOT WORK!

You have almost certainly heard experts and veteran athletes say you should “race like you train” and “never try something new on race day,” right? Evidently, most athletes don’t think this applies to the days leading up to the event too. I constantly see athletes massively changing their calorie, fluid, and sodium intake just before a big endurance event, competitive or not. These practices contradict the old adages and human physiology!

The simple truth is that maintaining constant calorie, fluid, and sodium intake while you simultaneously reduce expenditures in the taper phase leading up to your event allows you to “load” all of these things as much as possible.

Hopefully, you have read our fueling booklet, the 5 Secrets to Success, and incorporated those practices immediately prior, during, and after your training and racing routine for complete success. But what do you do in the 72 hours prior to race morning? Keep reading for the answers.

In the old days, athletes were erroneously told that consuming copious amounts of calories, fluid, and sodium during endurance events would allow them to achieve optimum performance. 400-600 calories, 40-60 ounces of fluids, and 1-3 grams of sodium per hour were recommended in the ’80s.

Whenever exercise or competition went beyond three hours, stomach and GI problems were almost universal. Today it’s rare to find anyone still advocating these crazy numbers, at least in this country. Europe and Asia are another story.

As you know, if you have read our literature, hourly intakes of 120-180 calories, 20-25 ounces of fluids, and 400-600 mg of salt (sodium chloride)—as part of a full-spectrum electrolyte replenishment product—

are more reasonable and effective upper limits. We’ve been advocating this for three decades, and these numbers are now more-or-less the accepted wisdom of the crowd.

Unfortunately, the myths regarding “loading” in the days leading up to a big, hot event are still surprisingly pervasive. So, let me dispel this one more time and hope you will avoid making these mistakes this year and beyond.

CALORIES – We typically eat too much already. Increasing calorie intake during days of lower physical activity before an event only makes more work, fills your stomach and intestines, and likely leads to increased fat storage.

FLUID/WATER – We are not camels and cannot store water. Suddenly increasing daily intake by more than 10% will overly dilute the electrolytes in your blood, which increases the potential for serious issues associated with hyponatremia. Additionally, all that unnecessary water will excessively fill your bladder, causing you to prematurely lose electrolytes courtesy of frequent elimination.

SALT/SODIUM – Again, we typically consume too much. Increasing it even more will not improve heat tolerance. In fact, it puts the body into survival mode where it seeks to jettison the excess to avoid toxicity. Whatever your normal daily sodium intake in the weeks prior to an event, keep it the same all the way up to race start. Then, from the start of the event, consume reasonable amounts throughout.

The idea of “loading” anything in the days prior to a big event is not only outdated but completely counterproductive. EN

DON'T DO IT!

WHAT ABOUT
LIQUID ENDURANCE?

YES!



When it comes to fluids, drinking excess amounts only causes the athlete to increase the risk of overly diluting their blood levels of sodium and other electrolytic minerals.

That said, there is a way to maximize cellular fluid storage, and that's via the glycerol component in **Liquid Endurance**. Glycerol is a naturally produced metabolite of fatty-acid oxidation, and it absorbs rapidly when taken with water or sports drinks, increasing the water content in blood, cells, and extracellular spaces. All three of these compartments contribute to sweat volume, resulting in a significant increase in cooling efficiency during prolonged exercise.

The key to maximizing—not over-supplying, but naturally maximizing—how much fluid the cells can hold is to use a specific amount of Liquid Endurance in a specific amount of water (ranging from 16-28 ounces) for a 3-day period prior to a hot-weather workout or event. Follow the dosing instructions for best results.

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Dusty Dustyn brightens the road in her signature pink Hammer kit. Photo: Ray Prevost

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BY
MILES
FRANK



TRADITIONAL KIMCHI

As is often discussed here in Endurance News, the fuel that is consumed during training and on race day is minuscule compared to the total calories consumed. So when a serious athlete who trains 10-20 hours a week is asked “What do you eat when racing?” the question that should be asked is “What do you consume for consistent performance output?”

That consistent performance has many aspects, and luckily one of the key components that endurance athletes face is one I’ve never had to struggle with mightily. Gut issues, funny tummy, indigestion, whatever you call it, is far too common among the racers I meet and the athletes I talk with.

That’s where some of the underappreciated aspects of diet and supplementation can come in and provide huge benefits. The gut is the center of the body,



SAUERKRAUT

and without it functioning at a high level, you can’t use the fuel you put in on a race day and expect optimal use of the micros and macros consumed. The magic of probiotics is well known throughout ancient cultures, with products like yogurt in India and kimchi in South Korea, where universal daily consumption is the norm.

It’s easy and inexpensive to add foods like kimchi, sauerkraut, miso, yogurt, etc., to your dining table just a few times a week—and the benefits are outstanding. The connection between probiotics and gut health, and therefore consistent performance, keeps humans, especially extra-stressed endurance athletes, performing without a reduction in gut function.¹

You can’t really consume too much of the enzymes and good bacteria found in the aforementioned foods,



FERMENTED SAUCE


and supplements like acidophilus or Hammer Nutrition’s own Digest Caps and EnduroZyme can be taken daily when you don’t have access to the fermented products of your choice. Most weeks, I aim for 2-4 days when I make a conscious effort to include something like kimchi, sauerkraut, or miso in my diet. That way I get some variation in my diet while maintaining gut health and nutrient absorption.²

Of the many tips and tricks available to improve a kit, equipment, or fueling strategy, I seek out

“Take care of your gut health, and your performance and body will thank you!”

An easy and inexpensive way to get the good bacteria you need for consistent performance output

the dietary needs and timing my body responds to best. That's where the consistency comes in because the seasons and sports are so varied where I live in Whitefish, MT, and I do as much outside as I can when the opportunity presents itself. So I keep track of not only how much I eat, but also that I'm eating probiotic-filled foods that assist and propel me forward.

I also am sure to take my Digest Caps and EnduroZyme when that simply isn't possible. Take care of your gut health, and your performance and body will thank you! 



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NUTRIENT SUPPORT FOR HEALTHY KIDNEYS

BY STEVE BORN

I'm fond of saying that the liver is arguably the hardest working organ in the body because it performs more functions than any other organ. But if the liver is the hardest working organ, the kidneys can't be too far behind. And keeping them healthy, via dietary practices and nutrient support, is extremely important, as this article will detail.

According to the National Kidney Foundation:

The major function of the kidneys is to remove waste products and excess fluid from the body. These waste products and excess fluid are removed through the urine. The production of urine involves highly complex steps of excretion and re-absorption. This process is necessary to maintain a stable balance of body chemicals.

The kidneys perform their life-sustaining job of filtering and returning to the bloodstream about 200 quarts of fluid every 24 hours. About two quarts are removed from the body in the form of urine, and about 198 quarts are recovered.

The kidneys are powerful chemical factories that perform the following functions:

- **Regulate the body's salt, potassium, and acid content**
- **Remove waste products from the body**
- **Remove drugs from the body**
- **Balance the body's fluids**
- **Release hormones that regulate blood pressure**
- **Produce an active form of vitamin D that promotes strong, healthy bones**
- **Control the production of red blood cells**

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All of these functions performed by the kidneys are undeniably important for both athletic performance and overall health, but let's take a look at that last function: control the production of red blood cells.

The kidneys are responsible for the production of a hormone called erythropoietin, more commonly referred to as EPO. It is EPO that initiates the production of red blood cells from bone marrow, and these red blood cells, of course, are responsible for carrying oxygen throughout the body. Dysfunctional, damaged, or diseased kidneys cannot make sufficient EPO, which means the bone marrow makes fewer blood cells. This not only deprives the body of the oxygen it needs, but also causes anemia.

For a consistent supply of oxygen to the muscles, vital organs, and everywhere else in the body, endurance athletes must have maximum red blood cell production all the time. For that and all the other functions performed by the kidneys, it's extremely important that we support the health of our kidneys.

THREE KIDNEY-PROTECTING PRACTICES

1. **Avoid NSAID medications.** These drugs, especially when taken regularly and/or in high amounts, have been shown to damage the kidneys.¹
2. **Follow the Mediterranean diet.** This eating plan emphasizes the consumption of vegetables, fruits, whole grains, beans, nuts, and legumes. It gives hierarchy to fish and poultry over red meat for protein. It allows for limited amounts of dairy products and eggs. And it strongly discourages the consumption of processed foods.²
3. **Limit salt and sugar intake and avoid artificial sweeteners.** Excess salt is well known for its blood pressure-increasing effect, and hypertension is a key risk factor for chronic kidney disease (CKD). Sugar consumption, particularly from sweetened beverages—including artificially sweetened drinks—has been suggested as a prime contributor to the incidence of CKD in the United States,³ with one study demonstrating a statistically significant link between consumption of sugar-sweetened soda and CKD.⁴

NUTRIENT SUPPORT FOR THE KIDNEYS

Coenzyme Q10 (Race Caps Supreme)

CoQ10 is an extraordinary, multi-beneficial nutrient that has a wealth of research supporting its kidney-protective properties, especially via its impressive antioxidant properties. The kidneys are constantly under tremendous oxidative stress, which is understandable given the tremendous amount of blood flow and the high concentration of toxins that circulate



through them constantly. Oxidative stress, among its many deleterious effects, contributes to progressive kidney damage.⁵

Additionally, animal studies have shown that CoQ10 can protect the kidney tissues from numerous nephrotoxic (kidney damaging) drugs, including gentamicin, cisplatin, and cyclosporine.^{6,7}

SUGGESTED DOSE: 1 capsule of Race Caps Supreme 2-3 times daily

Omega-3 Fatty Acids (EndurOmega)

Omega-3 fatty acids from fish oil have been shown to significantly reduce blood pressure (high blood pressure is a risk factor for CKD) in several clinical trials on patients with hypertension.^{8,9}

Additionally, published research suggests that diets rich in omega-3s provide powerful protection against kidney disease.^{10,11}

SUGGESTED DOSE: 2 softgels of EndurOmega 2-3 times daily



N-Acetyl Cysteine and Silymarin (LSA Caps)

N-acetyl cysteine (NAC) is a sulfur-containing compound that, among its numerous and wide-ranging benefits, helps counteract the damaging effects of heavy metal toxicity and enhances the kidney's ability to excrete these heavy metals.^{12,13,14}

Silymarin is extracted from the seeds and fruit of milk thistle (*Silybum marianum*) and has antioxidant and toxin-blocking properties.^{15,16}

A wide body of research has shown silymarin (also great for the liver) to have kidney-protective effects, and it can reduce—and may even help avoid—damage caused by several types of nephrotoxic drugs.^{17,18,19,20}

SUGGESTED DOSE: 2 capsules of LSA Caps twice daily

Magnesium (Essential Mg)

High blood pressure compromises kidney health, and magnesium has been shown to reduce blood pressure at intake levels of 500–1000 mg daily.²¹

Additionally, a deficiency in magnesium (70% or more of the population is deficient) is associated with diabetes and metabolic syndrome, both of which are risk factors for kidney disease.^{22,23,24,25}

SUGGESTED DOSE: 1-2 capsules of Essential Mg up to 3 times daily



R-Alpha Lipoic Acid (Mito Caps)

In addition to its superb antioxidant/oxidative stress-reducing properties, which hugely benefit the liver, r-alpha lipoic acid, like NAC, is a sulfur-containing compound and has been shown to aid the kidneys by binding with and removing a number of toxic metals such as cadmium, lead, cobalt, and nickel (known as metal chelation).²⁶

R-alpha lipoic acid also improves kidney function by protecting against acetaminophen-induced damage, stabilizing blood sugar levels, and protecting against protein loss in urine.^{27,28}

SUGGESTED DOSE: 1-2 capsules of Mito Caps 2-3 times daily

SUMMARY

Avoiding NSAID medications, making some wise alterations to your diet, and providing ample amounts of key nutrients via Hammer Nutrition products will help keep your kidneys healthy and functioning properly. At the very least, you'll enjoy the performance-enhancing benefits of optimal EPO and blood cell production, with many more vitally important health benefits as well. **EN**



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Kirstin Lauritzen

Regarding Fueling During Training

When I first started training for triathlons, I wanted to know how to fuel during both events and training. Everyone always talks about their nutrition and fueling for competitions, but I wasn't able to find very much good solid advice for training season.

Fueling during training season can be broken into two parts:

1 • what to eat day-to-day to fuel for workouts and maximize glucose storage leading up to an event (no more carb-loading the night before!)

2 • how to fuel during actual workouts.

It is much more effective to consume the right amounts of micronutrients and macronutrients over the entire training cycle than to carb-load. There are a few ways you can figure out how much you need to be consuming.

Micronutrients are the array of vitamins and minerals the body needs in trace amounts to do all the jobs it does every day. We get a lot of these through plants. Try to aim for (and work up to) 8-12 servings of fruits and vegetables a day. A serving size is about ½ cup-1 cup of cooked veggies or raw fruit.

However, some nutrients are a little bit harder to get from the diet, like vitamin D. You can get vitamin D from plant-based sources like mushrooms, although it's usually easier to get the right amount from a supplement or by spending some time in the sun. If you aren't sure if you're getting enough micronutrients (you are experiencing fatigue, difficulty recovering post-workout, trouble focusing, etc.), you may want to find a functional doctor or nutritionist since they will often pull labs that can look at your vitamin and mineral status.

Macronutrients are important for knowing how much to eat throughout your day and also during your workouts.

In general, endurance athletes want to consume around 1.5 grams of protein per kilogram of body weight per day. That can go up or down depending on how often you train and if you are incorporating more strength training. The amounts of carbohydrates and fats consumed will vary quite a bit among athletes because some bodies prioritize getting energy from fat and others from carbohydrates.

I often recommend that athletes focus on getting starchy carbs, fruits, and proteins in the meals around their workouts and training, and then prioritize healthy fat, protein, and vegetables at the other meals. Without getting too specific with macros, this has been the easiest and best way to make sure they are getting a good variety.

It is also helpful to utilize products like Hammer Nutrition's **HEED®** for extra carbohydrates before and during longer workouts. For workouts that are one hour+, I recommend also experimenting with both **Hammer Gels** and solid food like **Hammer Bars** during training. In addition, Hammer's **Endurance BCAA+, Recoverite®, Vegan Protein,** and **Whey Protein** are fantastic for getting a wide variety of proteins (amino acids) for less soreness and better recovery. **EN**

"It is much more effective to consume the right amounts of micronutrients and macronutrients over the entire training cycle than to carb-load."



Kirstin Lauritzen, DC, MS, is a Functional Medicine Practitioner in Portland, OR. She specializes in helping athletes overcome chronic illness, optimize their nutrition, and lower their risk of injury. She loves to educate athletes about nutrition and its importance in training and life. She holds a Doctor of Chiropractic, a Master of Science in Human Nutrition and Functional Medicine, two Bachelor of Arts degrees (one in Psychology and Neuroscience and one in Spanish), and a Bachelor of Science in Human Biology. She is a triathlete and CrossFit athlete. She has also been Hammering since 2011 and is training for a full Ironman in St. George, Utah. **For more information, check out her website: gymcall.com.**

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- Strengthens immune system
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Start strong, finish strong!

Vincenzo Marchione finished his season with a National Championship *and* a Masters Championship, placing 1st in his age group at the Miami Man Triathlon powered by Hammer Nutrition. Photo: Andre Quirino



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You ask and we listen

Here are answers to some of our most frequently asked questions

BY STEVE BORN



LOADING DOSE AMOUNTS BASED ON BODY WEIGHT

UP TO 125 POUNDS:

- Day One: 4 capsules one time/day
- Day Two: 4 capsules two times/day
- Day Three: 4 capsules two times/day
- Day Four: 4 capsules three times/day

126-160 POUNDS:

- Day One: 4 capsules two times/day
- Day Two: 4 capsules three times/day
- Day Three: 4 capsules three times/day
- Day Four: 4 capsules four times/day

? I know that you recommend a 3+ week break between loading doses with Race Day Boost. I have an unusual situation where I have two very important events on consecutive weekends. Is it OK to do a 4-day load prior to each event?

SB Although we do recommend taking a 3+ week break (i.e., washout period) between loading doses of Race Day Boost, on the rare occasion when you have two important events happening on back-to-back weekends, it's acceptable to do a 4-day load with Race Day Boost prior to each event. The reason this is acceptable is you will probably deplete most-to-all of the sodium tribasic phosphate (the main ingredient in Race Day Boost) during or soon after the first event.

That said, please remember that we only recommend back-to-back loading doses with Race Day Boost on very rare occasions.

We recommend the 3+ week "washout" between loading doses for a few different reasons:

- **It may be possible to build up a tolerance to sodium phosphate**, which means you would need to take higher doses in the future to achieve the same kind of beneficial effects.
- During the standard (four capsules four times daily) loading dose protocol, you consume an additional 772 mg of sodium. Over a four-day period, that's 3,088 mg of sodium. **This is an excessive amount of sodium to add to one's diet on a regular basis.**
- **Sodium phosphate may inhibit efficient absorption of calcium.** Taken in loading dose amounts on a regular basis, this would obviously not be a healthy practice.

Since you're planning back-to-back loads with Race Day Boost, consider using the "loading dose amounts based on body weight" protocol that I put together. The reason I calculated this is the average weight of the test subjects in the original studies on sodium phosphate were cyclists weighing 160+ pounds, and they consumed 1,000 mg of sodium phosphate (the amount in 4 capsules of Race Day Boost) four times a day for four days. That's the "standard" loading dose protocol; however, it is theoretically possible—rational, even—that lighter-weight athletes could achieve the same results consuming less of the product. **EN**

? I noticed this statement on the back of my new HEED and Recoverite containers. Just curious, what's an "Informed Choice registered facility"?

SB Informed Choice is a quality assurance program for sports nutrition products, suppliers to the sports nutrition industry, and supplement manufacturing facilities. Registering as an Informed Choice manufacturing facility is a somewhat redundant effort that we make, though it is certainly a nice benefit to have.



As far as purity is concerned, all supplements are already required to be tested by a third-party laboratory to prove strength, purity, and identity of any raw ingredient used. Once the raw ingredients arrive at our manufacturers, they are sampled and sent to the labs for identity, purity, and microbial testing. The testing process strictly follows 21 CFR Part 111 of the FDA Guidelines for Dietary Supplements. The finished goods are once again third-party tested to be sure there was not any contamination in the manufacturing process. This is also a somewhat redundant procedure that we perform, as the facilities that make our products are Good Manufacturing Practices (GMP)-certified, banned substance-free facilities, so cross-contamination is not even possible. (NOTE: This is what I meant by "redundant" in the first paragraph.)

The WADA/USADA banned substance list can be found at wada-ama.org, and nothing on that list is in any of our products. All Hammer Bars and Hammer Nutrition encapsulated supplements are produced in facilities that hold National Science Foundation (NSF) Dietary Supplements GMP Registration. Hammer Gel and all Hammer Nutrition powdered fuels are produced in a facility that holds Level 3 Certification under SQF (Safe Quality Foods) 2000 Program.

You can read more about our Commitment to Quality statement on our website and in our FAQ "What are your quality control procedures?" The information is a bit lengthy, but it goes over the multiple steps we take to ensure product purity. **EN**

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Real Fuel, Ready to Roll



"I ALWAYS HAVE ONE NEAR BY"

*"Yes! I use Hammer Bars after a ride or race if I can't get a meal right away. I will also eat these as a snack or even a lunch replacement."
- Online Reviewer*

- **Reliable, long-lasting energy**
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Single Bars **\$2.50 ea**
12 or more **\$2.25 ea**



Barkley Marathon Finisher and ultramarathon legened **John Kelly** climbs an ascent at the Lavaredo Ultra Trail Race in Italy. Photo: Quinn Carrasco

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IT'S HERE!

CHITOLEAN

BY STEVE BORN



Though most of us do our best to eat the healthiest diet possible, often—such as when we're visiting friends or dining in restaurants—we find ourselves in a situation where there's too much fat in the meal. That's where the triple-nutrient ChitoLean (pronounced: CHIT-uh-lean) formula is ready to go to work.

CHITOLEAN DOES ALL OF THE FOLLOWING:



- Helps improve body composition
- Supports healthy cholesterol levels
- Powerfully assists fat burning
- Promotes healthy bowel movements



CHITOLEAN CONTAINS THREE INGREDIENTS

Chitosan (pronounced: CHIT-uh-san) is an indigestible fiber, meaning it traverses the GI tract without being absorbed. En route, chitosan—with a powerful assist from vitamin C—effectively binds with fat and blocks its absorption. N-acetyl-L-carnitine (aka “acetyl-L-carnitine”) accompanies the formula to ensure effective fat oxidation (“burning”).

PER 3 CAPSULES:

Chtiosan Complex	1500 mg
N-Acetyl-L Carnitine	250 mg
Vitamin C	100 mg

SUGGESTED DOSE:

Take three capsules shortly after beginning consumption of a high-fat meal. Be sure to drink at least eight ounces of water when using ChitoLean. Consume healthy fats (fish oil), fat-soluble vitamins (A, D, E, K), and medications at least four hours before or after taking ChitoLean.

INGREDIENTS

Chitosan is a fiber composed of chitin, which is a component of the shell of shellfish. The strong positive charge carried by the chitosan molecule causes it to bind with negatively charged substrates such as fat. Chitosan effectively binds with fat in the intestines, blocking absorption. Also, it has been shown to lower blood cholesterol in animals and humans. As a result, dietary supplementation with chitosan may not only assist with weight loss and normalization of cholesterol levels, it may also help inhibit the formation of atherosclerotic plaque (deposits of fat and other substances that accumulate in the lining of the artery wall).

*No time to waste,
Get lean and
mean*

*Block that fat
and acheive your
dream*

*with Chitosan,
Vitamin C &
L-Carnitine . . .*

*Lose the weight
with
CHITOLEAN*

Strictly regarding weight loss, one study involved 150 overweight men and women. One group was given three grams of chitosan daily, while the other was given a placebo. Both groups were provided with the same self-monitored behavior-modification program. After 60 days, the chitosan group lost an average of 2.8 pounds, while the placebo group lost 0.6 pounds. The chitosan group also had greater reductions in fat percentage and fat mass than the placebo group, along with an improvement in body composition.¹

N-Acetyl-L-Carnitine is an amino acid and, like all forms of L-carnitine, it is THE nutrient that transports fatty acids into cells for the production of energy. Without adequate supplies of L-carnitine, fatty acids cannot be effectively burned as a fuel source. Exercise depletes carnitine levels, as does the aging process.²

Vitamin C helps activate chitosan in the stomach and intestines into a fat-absorbing gel, increasing the fat-binding effects of chitosan. Research on guinea pigs using either chitosan or a chitosan/vitamin C combination concludes, "Vitamin C increased the fecal fat excretion by chitosan in guinea pigs, thereby reducing body weight gain."³ **EN**

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CHITOLEAN

Phenomenal Fat Blocker

FROM OUR EXPERTS:

"BIND AND BLOCK THE FAT. LOSE THE WEIGHT."

"When we find ourselves in a situation where there's just too much fat in the meal, ChitoLean is ready to go to work." - Steve Born

- Improve body composition
- Support healthy cholesterol levels
- Assist fat burning



Hammer employee and accomplished ultrarunner, **Aryn Maznio** runs the Lion Mountain trails in Whitefish, Montana.

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DEMYSTIFYING FAT

PART 2: FAT IN THE HUMAN DIET

BY DR. BAYNE FRENCH, MD DC

As we start to understand the lunacy of standard nutritional advice and begin thinking for ourselves, it seems there is a collective ebb in the deeply ingrained notion that carbs are somehow good for us and a flow in our understanding that significantly limiting them opens doors of health and vitality. But the idea that the consumption of fat is good for us? A tougher prospect, but fortunately one that is the topic of much debate and dialogue. Good fat, bad fat, fat that needs to stay, fat that needs to go—frankly, it’s hard to keep track of it all. In *Demystifying Fat, Part 1*, in **Endurance News 118**, we discussed the genesis of the human diet and the role of carbs and fat in that development. We talked about how you can’t trust what is recommended in a pyramid or on a plate. Instead, a study of what humans have eaten throughout our history combined with the DIMADS (Does It Make Any Darn Sense) Test can reveal much about the correct relationship between fat and the human diet. As promised, now we’ll tackle the different types of dietary fat and how they interact with your body.

1 SATURATED FATS

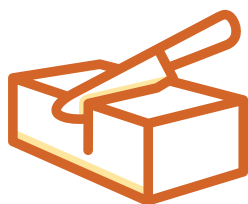
Let’s delve into the most contentious fat issue of them all. After decades of pounding the desk, the anti-egg yolk cohort has finally quieted, yet the drumbeat continues on promoting “heart-healthy” omega-6 vegetable oils and maligning saturated fat.

Saturated fat is comprised of fatty acids with only single bonds (no double bonds) linking the carbon atoms together in the chain. Specifically, it is “saturated” with hydrogen atoms. There are short chain, medium chain, and long chain types, some with odd numbers of carbon and others with even. Not many things are subject to more butchered thinking than saturated fat, except maybe that whole grains are good for you (yes, there will be future articles on your cold cereal). We’ve eaten saturated fat forever, as much and as often as we could.

So what’s the problem with saturated fat? In the 1950s Dr. Ancel Keys performed flawed and biased research concluding that saturated fat caused heart disease. The specifics of these unfortunate events are detailed in *The Big Fat Surprise* by Nina Teicholz. Decades of nutritional policy inexplicably followed, leaving such a mark that “fat is bad” became etched in our psyches.

Another black eye for saturated fat is that it raises cholesterol. For many with antiquated thought processes, elevated cholesterol goes hand in hand with heart disease, America’s greatest killer. But this connection is extremely weak and applies only to oxidized/damaged cholesterol. I have no fear of dietary cholesterol. I raise quail, ducks, and chickens for their oval cholesterol-rich nuggets. Well, a skunk recently killed all my quail and ate their heads. Apparently, quail brain is loaded with fat too (the human brain is 70% fat). The issue of cholesterol will likely be addressed in future articles, but just know there is a deeper story about “good” and “bad” cholesterol involving oxidation,

“Saturated fat is a precursor to hormone production, it improves immune function, it contains several essential vitamins, and it offers an excellent source of energy.”



LDL particle number and size, arterial inflammation, etc., that has a far greater contribution to cardiovascular disease than the absolute amount of cholesterol we possess in our blood.

Higher levels of some saturated fats (stearic acid and palmitic acid) in the blood are associated with heart disease. It is critically important, however, to understand that these blood fats do not come from consumed fat, but rather, they are constructed from all carbs.¹ I check blood work on thousands of patients. The carb-eating, fat-avoiders have high blood triglycerides (and a very unfavorable cholesterol profile with lots of small LDL particles). Low carb, high fat eaters very commonly have triglycerides under 100. And very high fat, ketogenic eaters sometimes have triglycerides under 40! **Also, what is paramount to realize is that saturated fats cause harm, through inflammation, only when eaten with carbs or when not enough omega-3 fats are consumed.**² I am very comfortable with the fact that saturated fat does not cause heart disease. This is supported by numerous studies.³

Some of the benefits of saturated fat are that it provides structure and function to our cell membranes, is a precursor to hormone production, improves immune function, contains several essential vitamins, and offers an excellent source of energy.

Sources of saturated fats include animal meats and fats (especially red meat), cheese, cream, butter, milk, coconut oil, palm oil, and palm kernel oil.

About 50% of the wall of each of our trillions of cells (lipid bilayer) is saturated fat, and over 50% of the fat in breast milk is saturated. A brief study of female chest anatomy should make it pretty clear that we are designed to consume it. The theory that saturated fat is vital in infancy but detrimental in adulthood doesn't pass the DIMADS test.

2 MONOUNSATURATED FATS

This type of fat is comprised of fatty acids with single bonds and one double bond in the chain.

This type of fat is widely agreed to be the most favorable for your health, and it is the primary driver behind many physicians recommending the Mediterranean diet, which is rich in olive oil. Known benefits as outlined from numerous sources include weight loss (especially from the midsection), improved sensitivity to insulin, reduced diabetes risk, reductions in arthritis pain, less LDL oxidation, and reduced risk of blood clots and strokes.

Common sources of healthy monounsaturated fats include olives and olive oil, avocados and avocado oil, various nuts, dairy, and animal fats. The American Heart Association lists only one of the above—olive oil. It lists oil sources from canola, peanut, safflower, and sesame. Although these oils do possess monounsaturated fatty acids, they are also loaded with omega-6 fats (described below) and are obtained with high heat and chemical solvents. I don't buy them or cook with them. (But a thin layer of canola oil between the toes reduces blistering on long runs.)

“Known benefits of monounsaturated fats include weight loss, improved sensitivity to insulin, reduced diabetes risk, reductions in arthritis pain, less LDL oxidation, and reduced risk of blood clots and strokes.”

CONTINUED ON NEXT PAGE...



3 POLYUNSATURATED FATS

These are fats with single bonds and more than one double bond in the chain, and they come in two types: omega-6 and omega-3. The difference between omega-6 and omega-3 is one of structure; specifically, the distance the last double bond is from the end. In the body, however, there are numerous biochemical differences between omega-6 and omega-3 fats.

They, like other fats, play critical roles in membrane structure, cellular signaling, immune function, hormonal function, and inflammatory pathways.

Sources of polyunsaturated fats include vegetable oils (3 s's and 3 c's: safflower, sunflower, soybean, corn, canola, cottonseed), nuts, seeds, algae, and animals.

As with other fat types, there are numerous polyunsaturated fats. Two of them are unique in that they are “essential,” meaning we cannot produce them in our bodies, they must be consumed. These are the omega-6 **linoleic acid (LA)** and the omega-3 **alpha-linolenic acid (ALA)**. Other types may be synthesized in the body from these two, and they can also be eaten. These include DHA, EPA, AA, and GLA. There are a couple of things of great importance becoming apparent about these fats. One is the means by which they are extracted, and the other is the ratio of omega-6 to omega-3 in our diet.

Studies of our evolutionary nutrition profile indicate an omega-6 to omega-3 ratio of 1:1, up to 4:1. Given the ubiquity and low cost of omega-6 fats, their delicious nature in deep-fried foods, and their being widely touted as “heart-healthy,” we are certainly not suffering from an omega-6 deficiency. Omega-3s, however, are harder to come by. They are found in wild-caught fish and other seafood, algae, and eggs and meat from animals that ate their native food (picture the opposite of a feedlot cow). **Thus the omega-6 to omega-3 ratio in our diets is high, and research supports this as a driver of disease.**⁴

“Omega-3’s are hard to come by and are found in wild-caught fish, seafood, algae, and eggs and meat from animals that ate their native food.”



LA (linoleic acid) again, is the essential form of omega-6. It is the most widely consumed fat of any kind in America. Vegetable oils are loaded with it, and soybean oil is king. It has been shown to lower LDL cholesterol, and since many physicians still view LDL cholesterol as “bad” cholesterol, they love LA. It is, however, easily damaged, especially when heated, creating oxidized linoleic acid metabolites (OXLAMS), which are oxidized, harmful forms of this fat.

AA (arachidonic acid) is an omega-6 fat made from LA. It is also found in animals, and interestingly is higher in animals not consuming their native foods, like farmed fish and grain-fed livestock. If the ratio of omega-6 to omega-3 is elevated, more AA is produced, which leads to several compounds that *promote inflammation*.

GLA (gamma-linolenic acid) is a beneficial type of omega-6 found in evening primrose seed oil, borage seed oil, and black currant seed oil. Our bodies produce GLA from LA; however, a deficiency can occur when there is a reduction in the efficiency of the conversion process as people grow older or in the presence of disease or if the consumption of LA is insufficient.

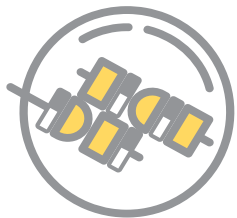
ALA (alpha-linolenic acid) again, is the essential form of omega-3. It is the primary plant source of omega-3, including vegetable oils, hemp, flax, and chia. It is also found in animal products. As mentioned above, vegetable oils contain a lot of LA, which directly interferes with the conversion of ALA to very beneficial EPA and DHA.

EPA and DHA are “semi-essential” in that they are produced from ALA. They are of such critical importance, and their conversion from ALA so easily interrupted, that many authorities view their consumption to be essential to optimal health. They may be consumed from wild animals or from raised animals allowed to consume their native foods. The only plant source of DHA is algae. DHA is considered by many to be one of the most important nutrients of any kind. It makes up 25% of the weight of our brains, 90% of the omega-3 fats in our brains, and half of the membrane of each one of our nerve cells (neurons). The richest source of DHA in all of nature? Breast milk. DHA supplementation has been shown in a double-blinded manner to significantly improve memory and reduce errors.⁵

Trans fats are fats created through the process of hydrogenation. Adding hydrogen to vegetable oil makes these liquid fats solid, which aids their spreadability. In this solid form, they are also easier to transport and store. Hydrogenation was largely driven in the late 1800s by the abundance of soy oil and the shortage of butter. Since the hydrogenated fats are unsaturated, they were advocated as being healthy. **But many, many studies have linked the consumption of trans fats to heart disease, diabetes, obesity, dementia, cancer, and sudden death.**

In 2006 the FDA required that trans fats be shown on food labels. In 2013 the FDA declared them “not safe to eat.” Foods labeled “trans fat free” may still contain up to 0.5 grams of trans fat per serving. They are present in processed foods and anywhere unstable polyunsaturated vegetable oils are heated.

CLA (Conjugated linoleic acid) is a very interesting naturally occurring trans fat found in grass-fed beef, its dairy products, and other animals that eat their native foods. CLA is a potent antioxidant and confers protection against cancer, heart disease, and diabetes, and it offers benefits on metabolism and weight loss.⁶



“Fat is delicious and nutritious and is vital to optimal human function and health.”

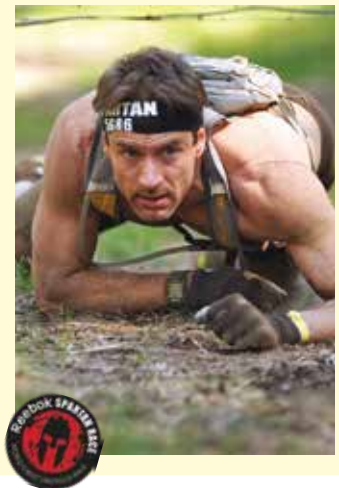
CONCLUSION

If you come to understand this message and the general concepts of the different kinds of fats, you’ll know more than 99% of the people who give out dietary advice, and certainly more than those still beating the “heart-healthy omega-6 vegetable oil” drum! That message is hopefully enjoying its death song. Fat is delicious and nutritious and is vital to optimal human function and health. Low carb eating without higher fat eating is a waste of time, not sustainable, or based on sound nutritional principles. Fat is NOT meant to be consumed with carbohydrate, and “sweet fat” (ice cream, sorry) is the worst. **As always, fat sources should be organic. If the fat is from an animal, the animal should have eaten only their native foods.** Remember, cows are not grain eaters and chickens are predatory!

Never has this quote, one of my favorites, from the German physicist Max Planck, rung truer than in regard to the dogma of dietary fat:

“A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.” - Max Planck EN

Dr. Bayne French, MD DC, Hammer Nutrition’s medical advisor, competes in the Bigfork Spartan Beast. Along with an MD from the University of Washington, Dr. French brings over 20 years of health experience, with a focus on wellness, to the Hammer team. Dr. French currently works at Glacier Medical Associates and is double board certified in Family Medicine and Obesity Medicine. Bayne picked up obstacle course racing in 2013. He won the Masters division of the Bigfork, MT Spartan Beast (2016) and the Monterey, CA Spartan Super (2016). He competed in the Spartan World Championship Ultra Beast in 2016 and earned a 2nd place finish in his division.



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ENDUROLYTES

The solution for a crucial component of fueling

BY STEVE BORN

At this time of the year, chances are you're ramping up your training volume and intensity in preparation for the first big events in 2020. Higher training volume/intensity, hot weather, or both combined, can significantly increase the opportunity for cramping. And cramping is a big zero on the fun-o-meter. Your workout is ruined, and a full-fledged cramping episode can leave you locked up in near paralytic pain. If you've ever been there, as I have (worst cycling disaster of my life), that's a bridge you want to cross only one time. If you've never been there, you want to keep it that way.

With temperatures on the rise, one aspect of your fueling—electrolyte replenishment—requires special attention. You may have heard this from us before, but it remains true: **electrolytes are comparable to the motor oil in your car; they don't make the engine run, but they're necessary to keep everything running smoothly.** Proper functioning of the digestive, nervous, cardiovascular, and muscular systems—particularly the latter—depends on adequate electrolyte levels.

Cramping is your body's way of saying "Hey! I'm on empty! Resupply me now or I'm going to stop!" It's like the oil light on the dash; you never want it to get that low. That's precisely why, just as you shouldn't wait until you bonk before you replenish calories or wait until you're dehydrated before you replenish fluids, you shouldn't wait for cramps to remind you to take electrolytes. Your fueling regimen should always include these essential minerals to replace them consistently.

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Endurolytes

Our original full-spectrum formula remains the go-to choice for thousands of athletes. Why? Because its precise balance of all the necessary electrolytic minerals just flat-out works! Endurolytes is supplied in capsules for greater flexibility with your dosing, and the low-salt (sodium chloride) content complements a healthy, low-salt diet.



Endurolytes Extreme

When the weather conditions are way out of your comfort zone, it's time to confidently tackle those conditions head-on! Endurolytes Extreme contains the same electrolytic minerals as do all the Endurolytes formulas; however, each Endurolytes Extreme capsule contains three times more salt (sodium chloride) and potassium as a capsule of Endurolytes, which helps offset higher-than-normal losses of those specific minerals. Also, athletes who consume a high-salt diet will require Endurolytes Extreme, as that dietary practice predisposes them to greater salt losses during exercise.



Endurolytes Fizz

If capsules aren't for you, Endurolytes Fizz is what you're looking for. Add these rapidly dissolving tablets to your water bottle to create a delicious, sugar-free, full-spectrum, effervescent electrolyte drink.



Endurolytes Extreme Powder

This has all the benefits of Endurolytes Extreme capsules in an easy-to-mix powder. Endurolytes Extreme Powder dissolves quickly and completely, with a subtle, natural watermelon flavor. Consume in water alone or add it to your liquid fuels according to your unique dosing needs. The mild flavor makes it easy to drink all day, while the lack of residue makes it perfect for hydration packs and bottles of any form.



CRAMPING IS A BIG
— ZERO —
ON THE FUN-O-METER



We also offer **HEED**[®], Hammer Nutrition's superior sports drink, which not only contains 110 calories per scoop, but also has the same number of electrolytes found in one Endurolytes capsule. Your body weight will determine how much HEED to use. Then you can use your body weight—and the weather conditions—to decide if additional Endurolytes capsules are needed on an hourly basis. **EN**



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Pre-Exercise Ignitor

What our clients are saying...



“THEY CALL IT MY CRAZY JUICE!”

*“I love this! The energy I get without feeling like my heart is going to beat out of my chest. I started taking this prior to my triathlons and while waiting for my wave, I’m cracking jokes and being silly. Hence the reason they call it my crazy juice. I’m a tad hyper, for the lack of better words. **It gives me the jolt to get started.**” – Nicki*



“HAMMER HITS ANOTHER HOME RUN!”

*“Love the Fully Charged! Used before my 14 mile run, and needless to say felt **fully charged**. I later took a second dose immediately after my run, and then swam 3300 yards—**felt amazing!** Thanks to Steve Born for the conversation about using Fully Charged during multi-hour workouts.” – Matt*

Clear • Calm • Focus



“I LOVE HAMMER FULLY CHARGED!”

*“I dissolve a packet in my water before my runs and it works! I most recently ran a half marathon and drank one packet before, and another at mile eight. **I finished almost 10 minutes ahead of my projected time!**” – LV*



“WOW WHAT A DIFFERENCE!”

*“I got a single stick packet of Fully Charged in my Hammer welcome kit, and drank it before my long run this morning. I was planning on 9 easy, slow miles and wound up running slightly more than 10. **I felt strong when I would otherwise have been pretty tired,** and was able to push a faster pace without too much effort. I’m super pleased with the results!!” – Ida*



“DON’T LEAVE HOME WITHOUT IT!”

*“I tried this product for the first time on a Saturday when we hold our longer paddle training days. I took it about 30 minutes before we started our 80% race pace which lasts about 2 hours, and my energy level steadily increased. **When you feel like you have more energy coming to the end of your training than you did when you started, that’s a great day in my book!** There was no stomach upset, jitters or discomfort. Since then we’ve trained same pace up to 3.5 hours and it is still working great on one dose. I highly recommend this for all endurance sports.” – Judy B*

Hammer Rocket Fuel!

FULLY CHARGED

Pre-Exercise Ignitor



“GO LONGER, GO STRONGER!”

“Fully Charged has become a game changer for me on big training days and races. It keeps my legs moving without fatigue.” - Online Reviewer

Scott Mooney successfully tackles the trails at Montana Enduro Series in Grand Targhee.

Photo: Jason O'Neil



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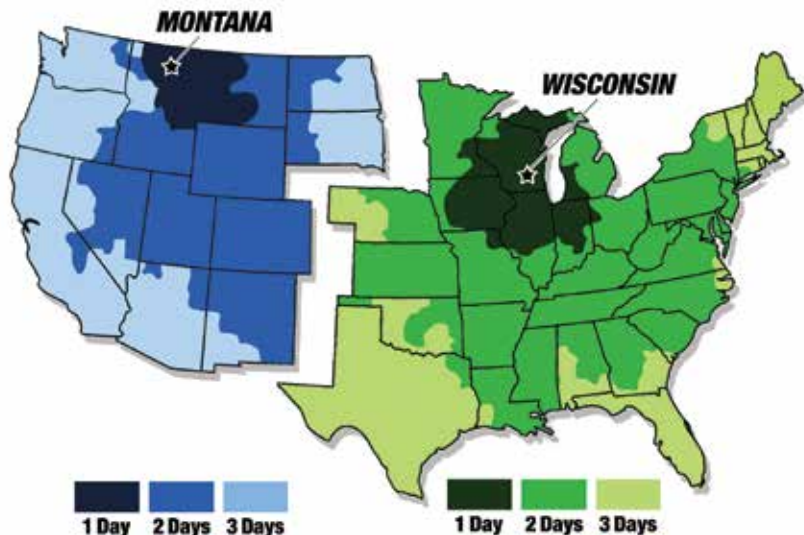
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SOS 5 Secrets #2

of Success

CALORIES COUNT

Proper calorie intake involves two primary things:

Which fuels or foods you consume and how much you consume.

Both are equally important, so let's focus on each one.

HOW MUCH FUEL SHOULD I CONSUME?

Now that you know to avoid simple sugars and use complex carbohydrates to fuel your body, the question is, "How much?" The answer is: "The fewest calories necessary to keep your body doing what you want it to do hour after hour." For most people, this translates into a total of 120-180 calories per hour.

Always remember that the goal of calorie intake is not to try to match what you lose (calories burned) with equal or near-equal amounts of calories from your fuel. The words (paraphrased) of Dr. Bill Misner have always rung true for me, as I hope they will for you:

"To suggest that calories can be replenished at the same rate they are spent during exercise is simply not true. The goal of endurance exercise fueling is to postpone fatigue for as long as possible, not to replace all the calories, fluids, and electrolytes lost during the event."

Though we may burn several hundred calories an hour, our bodies are simply not equipped to replace those calories in equal amounts. We want to supply our bodies with just enough calories to maintain consistent energy production. The vast amounts of calories from body fat stores will naturally help "bridge the gap" between what we lose and what our bodies can comfortably accept in return.

"Fueling lean," as we at Hammer Nutrition like to put it, makes sense because you're working in cooperation with your body, not against it. We're certain that, once you get away from the 500-700 calories per hour regimen that, sadly, many so-called experts still incorrectly recommend and follow our "body cooperative" amounts, your body will perform much better, you'll feel better, and you'll get the results you trained for.

For more information on this topic, read the article "Calories Count" in 5 Secrets of Success. You can download your free copy from the Hammer website: hammernutrition.com

WHICH FUELS SHOULD I CONSUME?

Too many athletes fuel their bodies on the premise that "I'm burning so many calories I can eat whatever I want. Calories are calories, right?" The answer, of course, is "NO." The quality of what you put in your body determines the kind of energy you can expect it to provide you in return.

Fuels comprised of simple sugars (anything that ends in "ose": glucose, sucrose, fructose, etc.) won't do the job for these reasons:

1 When consumed in proper amounts (i.e., the very limited amount your body can comfortably digest), they cannot supply a sufficient number of calories for energy production. However, you can't consume more of these sugar-loaded fuels in hopes of meeting your calorie needs because they won't digest with any efficiency.

2 When these sugar-laden fuels digest, the energy they supply is very short-lived, a "flash and crash," "peak and valley" type of energy. You feel great for a short period of time and then fall into an energy rut for a much longer period.

"Fuels comprised of simple sugars (anything that ends in 'ose': glucose, sucrose, fructose, etc.) won't do the job."

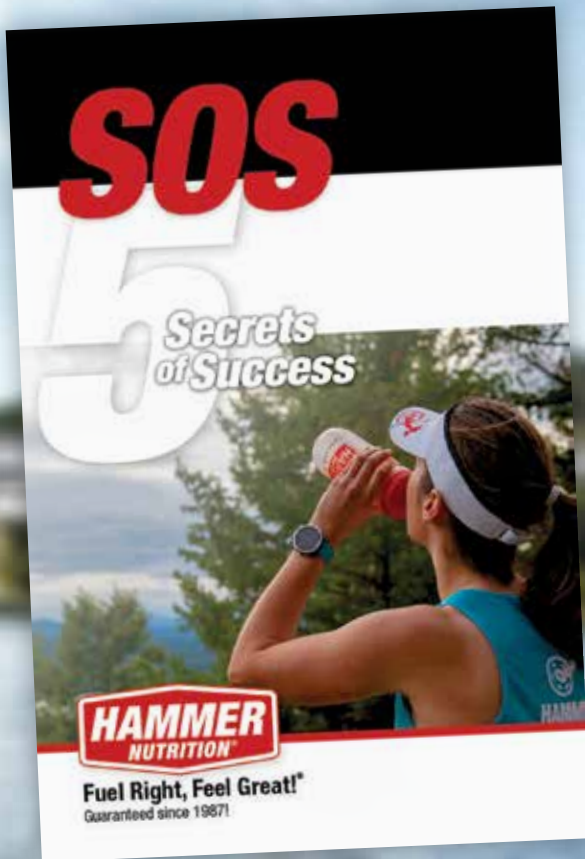
Hammer Nutrition fuels are comprised of maltodextrin, a starch-like complex carbohydrate. Maltodextrin is a better fuel option than simple sugars for two key reasons:

1 Your body can easily digest a greater volume of calories from complex carbohydrates than it can from simple sugars. This allows your body to receive maximal amounts of calories for energy production, while eliminating the stomach distress issues so common with simple sugars. As Dr. Bill Misner states, "The gold-standard carbohydrate source originates from longer-chain carbohydrates (maltodextrin) because more caloric volume crosses the gastric lining with less distress to the competing athlete."

2 Because maltodextrin is hundreds and hundreds of saccharide molecules weakly linked together—not just one or two molecules like all of the "ose" sugars—it supplies a longer-lasting, more evenly-supplied energy.

When it comes to endurance fueling...

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Get exclusive answers you need to succeed with Hammer Nutrition's easy-to-read FREE fueling guide that will help you

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Powerful recommendations

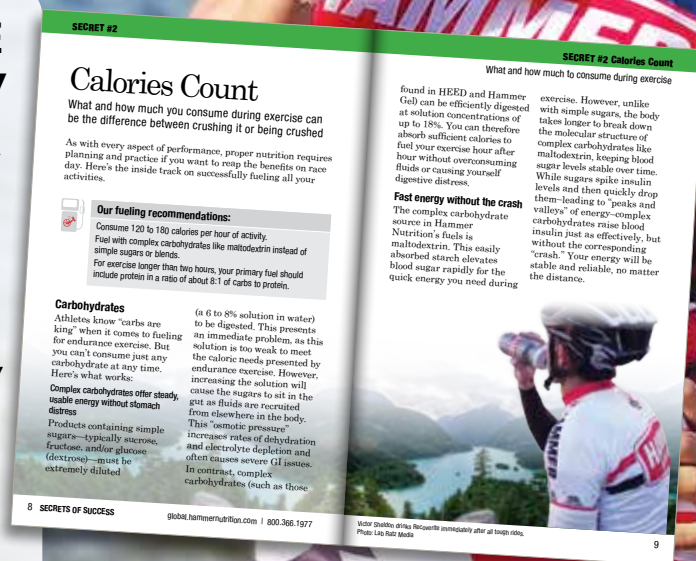
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*“Great source of information! This is the perfect guide for how and when to use the full array of Hammer Nutrition's endurance fuels. As an Ironman athlete, having a proper fueling strategy can mean the difference between getting a Kona slot and getting a DNF. Use the **SOS checklist** before every race and you don't have to worry about getting it right.” - Online Reviewer*

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SECRET #2 Calories Count

What and how much you consume during exercise can be the difference between crushing it or being crushed

As with every aspect of performance, proper nutrition requires planning and practice if you want to reap the benefits on race day. Here's the inside track on successfully fueling all your activities.

Our fueling recommendations:
 Consume 120 to 180 calories per hour of activity. Fuel with complex carbohydrates like maltodextrin instead of simple sugars or blends. For exercise longer than two hours, your primary fuel should include protein in a ratio of about 8:1 of carbs to protein.

Carbohydrates

Athletes know "carbs are king" when it comes to fueling for endurance exercise. But you can't consume just any carbohydrate at any time.

Here's what works:
Complex carbohydrates offer steady, usable energy without stomach distress. Products containing simple sugars—typically sucrose, fructose, and/or glucose (dextrose)—must be extremely diluted

(a 0 to 8% solution in water) to be digested. This presents an immediate problem, as this solution is too weak to meet the caloric needs presented by endurance exercise. However, increasing the solution will cause the sugars to sit in the gut as fluids are recruited from elsewhere in the body. This "osmotic pressure" increases rates of dehydration and electrolyte depletion and often causes severe GI issues. In contrast, complex carbohydrates (such as those

SECRET #2 Calories Count

found in HEED and Hammer Gel) can be efficiently digested at solution concentrations of up to 18%. You can therefore absorb sufficient calories to fuel your exercise hour after hour without overconsuming fluids or causing yourself digestive distress.

Fast energy without the crash

The complex carbohydrate source in Hammer Nutrition's fuels is maltodextrin. This easily absorbed starch elevates blood sugar rapidly for the quick energy you need during

exercise. However, unlike with simple sugars, the body takes longer to break down the molecular structure of complex carbohydrates like maltodextrin, keeping blood sugar levels stable over time. While sugars spike insulin levels and then quickly drop them—leading to "peaks and valleys" of energy—complex carbohydrates raise blood insulin just as effectively, but without the corresponding "crash." Your energy will be stable and reliable, no matter the distance.

Barbora Krsmaru celebrates her success after a podium finish at the Gladiator Race Czech Paradise. Barbora competes for the Hammer OCR Team in the Czech Republic. Photo: Barbora Krsmaru

FROM THE KITCHEN OF **LAURA LABELLE**

When the weather is warmer and spring is in the air, I love to eat simply and prepare meals quickly and easily.

This way, I have more time to enjoy my time training or playing with my family. Cooking at home is a pleasure since I know exactly where my food came from, who touched it, and how it was stored and prepared. I love eating simple home-cooked foods because my body feels better and I sleep better. Also, I don't get indigestion; I have a very sensitive stomach.

"In the Kitchen with Hammer Nutrition" has several options in regard to grilling. I also like to quickly pan sear fish and meats to mix it up. If you use fun rubs, spices, and fresh herbs, you can experience different tastes and textures without having to pay restaurant premiums. Some of my favorite recipes are just using no recipe at all and making use of what is in my refrigerator at the time. The challenge and excitement of discovery is always good fun.

"I love eating simple home-cooked foods because my body feels better and I sleep better."

Eating lots of fresh veggies is always my priority! I like to go to the organic section of my farmer's market and see what is the freshest in season at the moment. I then select my veggies and decide which protein might complement what I have. For this month's selection, I am making a compilation of two recipes I would typically throw down for a quick dinner.

I often get questions and expressions of consternation about timing meal preparation so that everything comes together hot and delicious at the same time. I like to teach my clients and children that you always start with whatever will take the longest to cook. Then you work backward through your menu.

QUICK AND EASY

So, for example, in this issue, I am giving recipes for pan-seared tilapia, mashed potatoes, and steamed garlic green beans. Here is an example of my process:

I know my mashed potatoes will take the longest, so I will begin there. First, I'll put a pan of water on the stove to boil. I'll wash my potatoes (peeling is an option here) and put them in the pan to boil. Then I will prepare the steamer and get ready with washed and trimmed green beans; once the water boils, this will only take a few minutes. I will then prepare my fish by seasoning and drenching it in flour. Next I will prepare the additives for the mashed potatoes and turn on the steamer. Once my mashed potatoes dish is set, I'll cover it and set it aside. Then I'll get the fish pan hot, and put in the fish fillet, skin side down. Next I'll put the beans in the steamer. I'll flip the fish, and the beans should be about done. I'll remove the beans from the stove and drizzle olive oil, salt, and garlic powder over them. By then, the fish should be done. And, with that, you have a delicious fast and easy meal ready to eat! EN

DELICIOUSLY FAST!



Acclaimed California-based chef Laura Labelle studied at *Ecole De Cordon Bleu* in Paris and received a "Grand Diplome" in cuisine and pastry. She has established two successful ventures, *Cafe Luna* and *Quality Food and Beverage* and also worked as a personal chef for various celebrities and

for *Mix This* music studio. Laura is an accomplished open water swimmer and enjoys practicing yoga and sharing her cooking with family and friends.

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FROM THE KITCHEN OF
LAURA LABELLE

**QUICK
AND EASY**

Easy
Mash

Garlic Green Beans

INGREDIENTS

- 1 lb green beans
- 1 TBSP butter or olive oil
- 1 garlic clove minced or ½ tsp garlic powder
- 1 TBSP chopped parsley



PREPARATION

Wash the green beans and trim off the stem ends. Heat steamer, and when the water is boiling, put the beans in. Steam for about 5 to 6 minutes. The cooking time will vary depending on your taste; I like my beans very green and crunchy.

Remove beans and toss in a bowl with the remaining ingredients and serve.

Easy Mash

INGREDIENTS

- 2 lbs Yukon Gold potatoes (washed, peeled, and quartered if desired)
- 1 cup milk or milk substitute
- 2 TBSP butter or olive oil
- Salt to taste

PREPARATION

Boil water and add potatoes. Once potatoes are soft when poked with a fork (about 15 to 20 minutes), remove from heat and drain. Add butter, milk, and salt. Mash like crazy and enjoy!

Try not to overmash or prepare in a food processor, as the potatoes will become very starchy and difficult to eat.

Pan-Seared Tilapia

INGREDIENTS

- 6 tilapia fillets
- 1 cup flour (your choice of wheat or gluten-free)
- 2 TBSP herbs de Provence
- 1 tsp garlic powder
- 1 tsp paprika
- Salt
- Pepper
- 2 TBSP olive oil
- 1 TBSP avocado oil
- Lemon wedges
- 2 TBSP chopped parsley

PREPARATION

Place tilapia on a sheet. Sprinkle with herbs and seasoning, and then turn over and repeat.

Put flour in a pie dish. Place each fillet in the dish and coat both sides with flour.

Heat oils in a non-stick pan. When hot, put tilapia fillets in, skin side down. Cook on each side about 4-6 minutes depending on the thickness of the fish.

Once golden on both sides, remove and sprinkle with parsley and serve with lemon wedges.





Pan-Seared Tilapia

Garlic Green Beans

MAGNESIUM

Powerful protection against diabetes

It's gotten to the point where asking "What DOESN'T magnesium do for health?" may make more sense than asking what magnesium does do for health. That's because this mineral—referred to as "the key to health and life" by magnesium expert James South—is involved in more than 300 biochemical processes in the body. That's a lot!

BY STEVE BORN

One area that's been studied quite a bit over the years is the role magnesium plays in protecting against diabetes. An article recently published in *Diabetes/Metabolism Research and Reviews* adds more ammunition to a growing body of research showing an association between increased magnesium intake and a decreased risk of type 2 diabetes. Also, supplementing with magnesium was shown to be associated with improvement of a number of factors relating to glucose metabolism.

Led by Dr. Binghao Zhao, researchers analyzed data from 26 research articles involving over 1.2 million men and women. None of the participants had diabetes or any usage of insulin upon enrollment in these 26 studies. Researchers followed the participants for an average of 11.2 years.

Compared to the participants with the lowest magnesium intake, those with the highest magnesium intake had an astounding 22% lower risk for type 2 diabetes. **Additionally, for each 100 mg increment increase in daily magnesium, the risk was reduced by 6%.**

Magnesium's effects on glucose metabolism were also studied. Over 1,100 participants with type 2 diabetes or high risk of the disease were shown to have improvements in many aspects of proper glucose metabolism—including fasting insulin levels and insulin resistance—when supplemented with magnesium. **Interestingly, these same participants showed improvements in blood pressure and cholesterol levels.**

Dr. Zhao and colleagues concluded, ***"For type 2 diabetes prevention, current evidence supports the recommendation for individuals to increase magnesium-rich diet consumption or supplement with magnesium."***¹

Research from 15 years ago showed that 68% of Americans do not consume the recommended daily allowance (RDA) of magnesium—320–420 mg for adults depending on age and gender. More alarmingly, this same research found that 19% of Americans do not consume even half this amount.² Given that this study dates back 15 years, it's not a stretch to say

that the percentage of Americans not obtaining the minimal RDA standard has risen. In fact, some researchers—including magnesium expert Dr. Carolyn Dean—suggest that up to 80% of the current U.S. population is likely deficient in magnesium.³

A more appropriate amount to aim for than RDA, however, is the Optimal Daily Intake (ODI) standard of 500-750 mg of magnesium. Dr. Shari Lieberman, who developed the ODIs, states:

"In order to attain a state of optimum health and disease prevention, we must take into our bodies optimum—not minimum—amounts of vitamins and minerals."⁴

Magnesium expert Mildred Seelig suggests even more precise dosages of 2.7 mg of magnesium per pound of body weight, with those under severe chronic stress or engaged in strenuous work/athletic training needing a dose of up to 4.5 mg of magnesium per pound of body weight.⁵


DIETARY AND SUPPLEMENTAL MAGNESIUM

Nuts and seeds are excellent sources of magnesium, so it's a good idea to include them in your diet. Two ounces of these particular foods provide the following amounts of magnesium:


- Almonds – 156 mg
- Brazil nuts – 128 mg
- Cashews – 148 mg
- Pine nuts – 132 mg
- Walnuts – 114 mg
- Pumpkin Seeds – 304 mg
- Sesame Seeds – 64 mg
- Sunflower Seeds – 200 mg

Other foods that are good sources of magnesium include the following:

- Artichoke – 1 cup provides 101 mg
- Avocado – 1 medium size provides 70 mg
- Banana – 1 medium size provides 34 mg
- Black beans (boiled) – ½ cup provides 60 mg
- Fig – 4 figs provide 44 mg
- Spinach (boiled) – ½ cup provides 79 mg
- Spinach (raw) – 1 cup provides 44 mg



Hammer Nutrition's **Essential Mg** contains five forms of highly bioavailable magnesium, yielding 100 mg of elemental magnesium per capsule. It is the ideal way to augment the diet to ensure that you're receiving optimal amounts of this all-important, health-benefiting mineral.



For even better results, use **Chromemate** in tandem with **Essential Mg**. See the article for more details at hammernutrition.com/blog/a-powerful-pair-for-insulin-resistance. **EN**

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Kamil Lesniak on a training run.
Photo: Andrzej Olszanowski

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AID STATION

BY STEVE BORN

Quercetin (pronounced: KWAIR-ceh-tin) is a compound that naturally occurs in a variety of fruits and vegetables, primarily red onions, apples, peppers, grapes, raspberries, and broccoli. This particular flavonoid has a number of beneficial properties:

1. It is a powerful antioxidant, which is why it's part of the antioxidant component (vitamins, minerals, auxiliary nutrients) in **Premium Insurance Caps**.
2. It is a natural antihistamine—helping to inhibit the release of allergy-causing chemicals—which is why it's a key component in **Clear Day**.
3. It has potent anti-irritation/soreness properties, which is why it's in **Tissue Rejuvenator** and **Vegan Tissue Rejuvenator**.

Recent research, published earlier this year in *Nutrition Reviews*, reveals that **quercetin has a beneficial role in reducing high blood pressure and optimizing lipid profiles**, making it a meaningful nutrient for cardiovascular health.

This latest research—a meta-analysis of 17 different studies—involved nearly 900 participants, many of whom had an increased risk of cardiovascular disease. For periods ranging from two to 12 weeks, researchers compared the effects of quercetin supplementation to a placebo or no treatment. In addition to blood pressure, triglyceride and cholesterol levels were also measured at the beginning and end of the research period.

The results showed that those participants taking quercetin had a significant reduction in blood pressure—a 3.09 mmHg average reduction in systolic blood pressure (the upper number) and a 2.86 mmHg reduction in diastolic blood pressure (the lower number). Participants who supplemented with quercetin the longest (8+ weeks) experienced a decrease in triglycerides and an increase in HDL (good) cholesterol.

The researchers concluded:

“The results of this meta-analysis indicate that quercetin has the ability to lower blood pressure without causing any significant adverse effects and may have the ability to significantly reduce triglycerides. Moreover, quercetin consumption significantly increased HDL cholesterol levels in cohorts who consumed quercetin for longer periods (greater than or equal to 8 weeks). Quercetin consumption may be an effective dietary modality to reduce cardiovascular disease risk in humans.”

Newly identified major benefits for quercetin



NOTE: A review of the research showed that quercetin supplementation significantly reduced blood pressure with dosages of greater than 500 mg/day. While there are many quercetin-containing foods, you'd have to eat a TON of them to get any appreciable amounts of quercetin, certainly nowhere near the 500 mg/day amount.

Supplementation with the following Hammer Nutrition supplements will easily get you to that mark:

- 4 capsules of Premium Insurance Caps supply 200 mg of quercetin
- 2 capsules of Clear Day supply 400 mg of quercetin
- 4 capsules of Tissue Rejuvenator or Vegan Tissue Rejuvenator supply 20 mg of quercetin EN

REFERENCE:

Huang H, Liao D, et al. Effect of quercetin supplementation on plasma lipid profiles, blood pressure, and glucose levels: a systematic review and meta-analysis. *Nutrition Reviews*. 2020 Jan 6. DOI: 10.1093/nutrit/nuz071.

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Ryan Ingham runs through the scenic hills of Colorado. Photo: Ryan Ingham



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COFFEE

LONGER TELOMERES

A key benefit of drinking coffee

“ The evidence that coffee consumption is a super healthy habit continues to grow. ”

WHAT ARE TELOMERES?

tel-o-mere

noun GENETICS

plural noun: telomeres

a compound structure at the end of a chromosome



A telomere is a region of repetitive nucleotide sequences at each end of a chromosome, which protects the end of the chromosome from deterioration or from fusion with neighboring chromosomes.

Think of telomeres like the caps on the ends of shoe laces. Without the coating, shoelaces become frayed, potentially entangled, and can no longer do their job.

Coffee has received a lot of good press (no pun intended) over the past few years, with research showing that consumption is beneficial for a wide range of health issues:

- Lowered risk of type 2 diabetes¹
- Decreased risk of prostate cancer, as well as a 40% lower risk of aggressive or lethal prostate cancer²
- Reduced risk of developing non-hormone-responsive breast cancer^{3,4}
- Nearly one-third lower incidence of colorectal cancer^{5,6,7,8,9}
- Significantly decreased risk of liver cancer¹⁰

Perhaps the most astounding finding of all comes from a study published in the *New England Journal of Medicine* that showed an association between coffee consumption and a reduction in the risk of death, which improved with the amount of coffee consumed. Compared to those who did not drink coffee, men

who had 2-3 cups per day had a roughly 10% lower risk of death.

Women in the study experienced even better results, with about a 13% lower risk of death compared to non-coffee drinkers. Regarding the study's findings, Dr. Neal D. Freedman wrote, "Coffee is one of the most widely consumed beverages in America, but the association between coffee consumption and risk of death has been unclear. We found coffee consumption to be associated with lower risk of death overall and of death from a number of different causes. Although we cannot infer a causal relationship between coffee drinking and lower risk of death, we believe these results do provide some reassurance that coffee drinking does not adversely affect health."¹¹

A new study sheds light as to a possible mechanism by which coffee consumption positively affects health and longevity:

longer telomeres, the protective caps at the ends of chromosomes. The length of telomeres is considered a biomarker of aging, with shorter telomeres being associated with a greater risk of age-related conditions, such as cardiovascular disease.

The study involved nearly 5,000 women from the Nurses' Health Study published in the *Journal of Nutrition*. It showed that participants who consumed two cups of coffee daily had a 29% higher chance of having longer white blood cell telomere length compared to those who consumed no coffee. Participants who drank three or more cups daily had a 36% higher chance of increased telomere length.

It's important to note that the beneficial effects on telomere length were found only in those who consumed regular coffee, which suggests that compounds in coffee other than caffeine may be responsible.¹² EN

DRINK UP!



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5 Questions

WITH HAMMER ATHLETES



A photo finish for Team Hammer Nutrition/53x11 at the Regalado Road Race. Hunter Ziesing took 3rd, **Matt Trethric** in 4th, and Tim Davis in 6th. Photo: Katie Miu

MATT TRETHRIC

1 Where are you from?

San Rafael, California

2 What sport do you participate in?

Bicycling: Road and Cyclocross

3 How did you hear about Hammer Nutrition?

I first found the Hammer Gels. Then I met team captain **Hunter Ziesing** by chance on a training ride. It opened my world to all the Hammer products.

4 Favorite Hammer products?

Perpetuem is my favorite fuel and **Tissue Rejuvenator** is my favorite supplement. When I leave for a race weekend, I don't walk out of the door without **Endurolytes**, **Perpetuem**, and **Hammer Gels**.

5 What keeps you motivated?

I want to stay fit so that I can compete at racing and help my team. Also, I want to follow the Hammer SOS program.



STACEY MULLIGAN

1 Where are you from?

I was born in New Jersey, but now I live in Colorado.

2 What sport do you participate in?

I originally started riding Freestyle BMX (bicycle motocross), but as I got older, I was ready for a sport that focused more on endurance. I now race mountain bikes and love 12- and 24-hour races.

3 How did you hear about Hammer Nutrition?

I first tried Hammer during a marathon and really liked how the gels didn't mess with my stomach. Then another Hammer athlete that I rode BMX with suggested I try some of the Hammer supplements. She was a huge fan of Hammer's Tissue Rejuvenator.

4 Favorite Hammer products?

Peanut Butter Hammer Gel and **Chocolate Perpetuem** are my favorite fuels. Hammer's **Essential Mg** (magnesium) has become my everyday go-to. I feel like it helps with overall recovery and helps me maintain really good sleep at night. Sleep is my #1 priority through training. That in addition to the **Hammer CBD** supplement has me falling asleep easily and staying asleep through the night.

5 What keeps you motivated?

I love adventure and seeing new places I haven't had the chance to see before, and for me, my bike is the best way to do that. A balance of racing, bikepacking, and long weekend adventures with my fiancé is what gives me joy and motivation to keep going year after year.

Photo: Karen Schroeder

BICYCLE SAFETY

BY MIKE FREEMAN

Photo: Kristina Parmalee



In Endurance News 117, I discussed bicycle safety as it relates to motor vehicles and our road cycling. Another thing that can certainly help you avoid collisions with motor vehicles and crashes involving poor road conditions is improving your bike handling skills.

Before I get into that, though, I would like to emphasize how important helmets are to our physical well-being while cycling. A good friend of mine, who is an excellent bike handler, was involved in a bicycle vs. auto collision a couple of weeks ago. The driver of the vehicle made the infamous “pass and turn right in front of the cyclist” maneuver.

WEAR YOUR HELMET

My friend hit the car pretty hard but was able to brake enough to turn his bike to the right so that he slid along the side of the vehicle on impact. His helmet and shoulder took most of the impact, although his glasses cut his face. Today he is walking and cycling wounded. Without the helmet, bike handling skills, and good luck, he would certainly have had major injuries, like traumatic brain injury or worse.

So stay alert and focused to be ready to take evasive action when necessary. And, next, I'll give you a couple of drills for improving your bike handling skills that I used when I first started cycling. I was lucky enough to be in an area where we had skills clinics that allowed practice with other riders.

I suggest that you practice these two drills without being clipped into your pedals. **WEAR YOUR HELMET.** Wear tennis or running shoes so you can get your feet off the pedals quickly in case you have to dab.

BALANCE IS THE KEY TO BOTH OF THESE SIMPLE BIKE HANDLING DRILLS:


- 1. Ride on grass.** Try accelerating, braking, and turning. Go slowly enough to maintain control and stay balanced. Try braking smoothly so you don't skid. Remember that if the front brake is locked, the front wheel will not steer and will probably wash out. You'll go down.
- 2. Set up an obstacle course with small cones or anything that will move out of the way easily if you hit them.** Set them up in a straight stager pattern so you can weave around them. Start with the obstacles far enough apart so you can run the course at a moderate speed. As you gain confidence and become more comfortable, you can shorten the distance between them and increase your speed. This is not a contest. It's a drill, so be careful.

Always ride with your head and eyes up. Look ahead—not right in front of your front wheel—10, 20, or 30 feet. Increase this distance in accordance with your speed. Then you will be able to spot poor road conditions or other obstacles and maneuver around them smoothly.

Avoid “target fixation.” If you look at an object long enough while moving, you'll steer right to it, probably hitting it. This also applies to cornering and the edge of the road. Always look through the turn to your exit point, not at the road edge.

GROUP RIDING AND RACING REQUIRE A DIFFERENT SKILL SET, BUT THE BASICS ARE THE SAME:

- 1. Do not overlap wheels while riding in a group.** And this is so whether you know the rider in front of you or not. It may be an easy wheel to follow, but the rider in front may have to take evasive action for some reason, which could cause the wheels to touch and take out your front wheel. OUCH!!!
- 2. Always point and call out potential hazards or obstacles that could cause a crash.** Some say just point it out. I say call it out as you point. It's everybody's responsibility, with the front riders first and then down the line.
- 3. When riding side by side, avoid looking at your partner while talking.** If your head is turned, you can easily miss a change in conditions, like slowing, stopping, or a change in direction.
- 4. Cover your brake levers with your hands on the hoods or drops.** This cuts your reaction time to brake the bike. Keeping your hands on top of the bars is fine if you're in a non-congested environment or at the front of the group.
- 5. Relax.** Have a relaxed but comfortable grip on the handlebars. A death grip on the handlebars cuts reaction time and the ability to control your bike smoothly.
- 6. You can't address bicycle safety without including the proper maintenance of your bicycle.** Wheels, tires, brakes, chain, and all control components must be in good/excellent operating condition.

Be SAFE. Have a great 2020 cycling season. Keep the rubber side down. - Mike 

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CONSUME CBD WITH FAT-CONTAINING FOODS FOR GREATER ABSORPTION

BY STEVE BORN

“It’s not what you consume, it’s what you absorb” is a phrase we at Hammer Nutrition are fond of saying. That’s true when it comes to the foods you eat, which is why we produce a full-spectrum digestive enzyme supplement, **EnduroZyme**, to help you get maximum absorption from the nutrients in the foods. It’s also true when it comes to individual nutrients, which is why you choose more bioavailable forms, such as magnesium in the bisglycinate form versus the oxide form.

Perhaps the most important one of all in terms of absorption and bioavailability is CBD. With cannabinoids—headed up by cannabidiol (CBD)—supplying such a massively wide range of benefits for so many areas of athletic performance and human health, it’s a no-brainer that you want your body to absorb and utilize as much as possible.

Unfortunately, orally dosed CBD has been shown to be poorly absorbed, with research suggesting that 6% - 10% bioavailability—perhaps as high as 20% on occasion—is the best one can hope for.^{1,2} Sublingual (under the tongue) dosing isn’t much better, with absorption/bioavailability ranging between 13% - 19%.³

Recent research has shown an easy way to significantly increase CBD absorption into the body: **consume the**

product along with high-fat foods.⁴ Researchers at the University of Minnesota divided study participants into two groups—one took CBD capsules orally on an empty stomach, the other group with a “standardized fatty breakfast” (i.e., breakfast burrito).

The results of the study showed that subjects taking CBD with fat-containing food had a 4-14 times greater amount of CBD in the body compared to the subjects who took CBD while fasting.

Four ways to get more bang for your CBD buck!

1. **Use Hammer CBD softgels or Hydro**, both of which use the proprietary nano microemulsion manufacturing process that increases absorption rates by up to 50%.⁵
2. **Whenever possible, consume Hammer CBD products with fat-containing foods.** You don’t need to consume a lot of fat for this beneficial effect to occur. Also be sure you choose healthy fats foods, such as avocados, nuts and seeds, olives, fatty fish (salmon), along with healthy oils, such as virgin olive oil and flaxseed oil.
3. **Take CBD with EndurOmega.** Hammer Nutrition’s premium-quality, super-healthy omega-3 fatty acid supplement from fish is a perfectly acceptable option for enhancing CBD absorption.
4. **Use EnduroZyme with each meal.**⁶ Not only will you get the maximum nutrient absorption of all the nutrients and compounds in your food; you’ll also be improving CBD absorption via two of EnduroZyme’s components:
 - **Lipase**, which helps break down fats and triglycerides and improves fat utilization.
 - **Bioperine™**, a standardized extract from the fruit of black or long pepper that enhances the absorption of whole food and dietary supplements.

SUMMARY

When it comes to CBD, you first need to choose the highest-quality products you can. Hammer Nutrition’s line of ultra-pure, 0.0% THC-containing CBD products has you completely covered in that regard. Then, to ensure maximum absorption and bioavailability—allowing you to receive the full value of the plethora of benefits CBD has to offer—take them with healthy fat-containing foods, oils, or EndurOmega and EnduroZyme. EN

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Aaron Plessinger recovering after a ride with CBD Hydro. Photo: [swapmotolive.com](https://www.swapmotolive.com)

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Cameron Sanders and his crew ride up Devil's Creek Trail to Resurrection Pass, Alaska fueled on Hammer Nutrition products. Photo: @renaissance.cyclist

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Mudslinger Events—some of the finest XC and ultra-endurance mountain bike events in the entire country—are headed up by Mike Ripley, a longtime friend of Hammer Nutrition. Their goal: “We love connecting people to unique places for the camaraderie, competition, and a great day on the bike.” Part of the Oregon XC Series, the Sisters Stampede is an annual Memorial Day weekend mountain bike race that takes place in the foothills of the Cascade Mountains. Taking its name from the Three Sisters mountains, a trio of towering peaks to its west, Sisters is a vibrant, artsy community with a charming 1880s facade and small-town ambience. Come for the fun, the fast racing, and the fantastic free kid’s race for little ones.

mudslingerevents.com/sisters-stampede



UPCOMING EVENTS

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Lock Haven, PA

4.11.2020

runemctc.org

Quantico Epic-Marine Corps Base

Quantico, VA

4.18.2020

quanticoepic1.qmtb.org

Earth Day Gravel Grinder

Northfield, MN

4.25.2020

teamroadlife.com/earth-day-gravel-grinder

Mighty Mujer Triathlon

El Paso, TX

4.25.2020

mightywomenetriathlon.com/elpaso

Hachie 50 Marathon, Ultra & Relay

Waxahachie, TX

5.1.2020

hachie50.com

Ice Age Trail 50

LaGrange, WI

5.9.2020

iceagetrail50.com

Sand Hollow Triathlon

Hurricane, UT

5.16.2020

bbsctri.com/sandhollow

OTHG Reno The Sandbox

Fernley, NV

5.22.2020

reno0thg.com

Cooperstown Triathlon

Cooperstown, NY

5.30.2020

coachmarkwilson.com/events/cooperstown-triathlon

Monsoon Fever Endurance Ride

Flagstaff, AZ

6.6.2020

A LITTLE HISTORY OF THIS AMAZING PRODUCT



BY STEVE BORN

About four years ago, I handed Brian Frank a product formula I had been working on for many weeks. He didn't know I had been pursuing this project, as I had spent many hours in research at night and on the weekends, but I could see his eyes light up as he reviewed the ingredient list. And he even liked the name I had assigned to this potential new product.

"Fully Charged?" he asked. "I like that. I like that a lot. And I like the formula. I think this is going to be a winner."

After several weeks of slight formula tweaks, especially with the flavor (more on that later), and after lots of personal testing, we came up with something truly amazing. The only thing left was to rename the headline that depicted what the product did. I had come up with something pretty blasé, but Brian asked, *"How about Pre-Exercise Ignitor?"*

BOOM!

And thus, a bit over 3½ years ago—August 2016 to be exact—the first bottles of Fully Charged became available. And people loved it, both for what it did and for what it didn't do.

The reason I came up with the idea for Fully Charged in the first place was because I wanted something to give me a little kick start before my workouts. What I didn't want was a product that was loaded with stimulants disguised as beneficial nutrients and/or an excessive amount of caffeine. I've tried those types of products before, and the only thing I experienced was a serious case of the jitters and the feeling that my heart was going to expand through my rib cage. Not performance-enhancing in my book, for sure.

I thought there had to be a way to help initiate, via a pre-workout supplement, benefits for exercise performance that could also be beneficial for general health. And that's when I started immersing myself in some serious research. In the end, while I had a number of ingredients I could have easily included in the formula, I was truly satisfied with the ones that made the cut. And here they are:

TAURINE – This amino acid has gotten somewhat of a bad rap because it's commonly found in many of the stimulant-loaded energy drinks you can find just about anywhere. But I'll tell you what, taurine is about the ONLY good thing in those drinks. It is a truly remarkable nutrient. Taurine is found throughout the body, especially in muscle and nerve tissue, and it assists in regulating heartbeats and muscle contractions, as well as neurotransmitter levels in the brain. Taurine is also essential for your body's proper usage of electrolytic minerals—calcium, magnesium, potassium, and sodium—and ensures proper muscle function. It also increases alertness, concentration, and focus without stimulating the nervous system. Perhaps most important to athletes, taurine supplementation is correlated with increases in maximal oxygen uptake and time to exhaustion due to its ability to buffer lactic acid and promote healthy pH levels.

BETA-ALANINE – Alleviating fatigue is always a beneficial effect for endurance athletes, and I wanted something to go along with the fatigue-fighting nutrients found in Anti-Fatigue Caps, as well as the taurine included in Fully Charged. Beta-alanine is an amino acid that increases concentrations of the dipeptide carnosine, a multi-beneficial compound, in muscles. Carnosine helps alleviate fatigue by acting as a buffer against increased acidity. It's also a powerful antioxidant, and it's been garnering a lot of press as a potential anti-aging nutrient, via its anti-glycation properties and effects.

NOTE: When first ingested, beta-alanine may (key word "may") cause a tingling sensation on the face. This is completely normal and entirely harmless. If it happens at all, the effect lasts for a minute or two, and with continued intake of beta-alanine, the effect often goes away for good.

L-CARNITINE FUMARATE – I've always been a fan of L-carnitine in all its forms. Like all carnitines, L-carnitine fumarate is responsible for transporting fatty acids into the mitochondria for conversion of cellular energy. Without sufficient supplies of this amino acid, the body simply cannot use fat as an energy source. Fumaric acid (fumarate) is a most-useful chelator of L-carnitine, being a Krebs Cycle Intermediate that plays a vital role in energy production.



PRODUCT LAUNCH EMAIL - AUGUST 2016

SPECTRA™ – I’ve been researching nutrients and nutrient compounds for over 30 years, and this is one of the coolest things I’ve ever come across. Elevating nitric oxide (NO) levels is a necessity for endurance athletes because it increases blood flow to muscles, enhancing the delivery of nutrients and oxygen to working muscles, thus supporting increases in endurance and strength. A proprietary blend of 29 nitrate-rich vegetable, fruit, and herbal ingredients, Spectra™ has been shown to increase nitric oxide (NO) levels by 64%, as well as inhibit free radical production and optimize cellular metabolic activity.

GREEN TEA EXTRACT (standardized to 50% polyphenols) – I knew that Fully Charged needed a little bit of a kick, something that would provide a quick-acting burst of mental and physical energy and give the user the distinct feeling that “something’s happening here.” A little caffeine would do the trick, but just adding “X” amount of synthetic caffeine wasn’t something I was interested in. Too many manufacturers just dump lots of caffeine in their product, I thought to myself, and that’s not what the Fully Charged formula is going to be about. That’s why I selected green tea extract. It fulfills the “pick-me-up” component via a small amount of caffeine (about 15 mg per serving), but more importantly, it provides benefits far exceeding that. You see, green tea contains polyphenols such as catechins—including an especially important one known as epigallocatechin gallate (EGCG)—which provide antioxidant and cardiovascular health support.

ElevATP™ – One of the more interesting nutrient/nutrient compound samples I’ve ever received, elevATP™ is a proprietary, clinically-researched blend of plant-derived trace minerals and polyphenol-rich apple extracts. Sounds pretty unusual, doesn’t it? It certainly did to me, and I admit to having a healthy dose of skepticism about this stuff. That is until a few of us put it to the test for several days, on its own, and without any other nutrient support. Our increased energy over those several days convinced me that I needed to include elevATP™ in the mix. It works with the body’s natural energy-producing mechanisms to stimulate production of adenosine triphosphate (ATP), the energy currency of the body.

HOT TIP: Take 1-2 **Energy Surge** tablets along with Fully Charged. I think you’ll really enjoy the beneficial effects of this ATP-producing combination.

BEET ROOT JUICE POWDER – A no-brainer for inclusion in the formula as it’s arguably the most popular nitric oxide-booster of all. With Beet Root Juice Powder and Spectra™, Fully Charged has a truly potent one-two NO-boosting combination.

L-TYROSINE – Helping to increase focus, alertness, and concentration—all very important things for athletes, especially ultra-endurance athletes who do races that involve some sleep deprivation—was a major goal of mine in creating Fully Charged. As mentioned earlier, stimulants and excess caffeine were not an option, which is why this amino acid—the precursor to several important neurotransmitters involved in alleviating stress and fatigue and promoting alertness—was a natural fit.

HOT TIP: Take 2 capsules of **Endurance BCAA+** along with Fully Charged. One of the benefits of BCAA supplementation is a decrease in the perception of fatigue on both a mental and physiological basis.

TART CHERRY EXTRACT (standardized to 6.5% anthocyanins) – Why not help protect against soreness before it starts? Tart cherry extract was the last nutrient to make the cut, and that was the idea behind including it. Cherries contain naturally occurring compounds (anthocyanins) shown to reduce aches and soreness, which in turn helps maintain normal muscle function during exercise and accelerates recovery afterward.

NOTE: Tart cherry extract possesses a super-strong taste, one that can’t be fully covered up or disguised. When you put tart cherry extract in a product, THAT’S your flavor option... unless you add a bunch of artificial sweeteners or sugar to the mix, which we at Hammer Nutrition will never do. This is the reason there will never be an orange or lemon-lime flavor of Fully Charged. We added tapioca maltodextrin and natural cherry flavor to soften and “round out” the flavor so that it would not only take down the extremely tart taste but also mask the not-so-great taste of most of the other nutrients.

I put in a lot of work designing Fully Charged because I wanted to provide athletes a safe yet highly effective pre-workout supplement. Unlike some other products, you won’t find a warning on Fully Charged that recommends you “start with a half-serving to assess your tolerance,” or cautions that “improper use may be hazardous to your health.” Quite the contrary: all of these nutrients have general health benefits as well as athletic performance ones.

No other pre-exercise product provides the wide-ranging benefits that Fully Charged does, and without subjecting you to the unpleasant, overly wired effect associated with those other products. This extraordinary product can be used prior to any workout or race, with additional doses every 3-4 hours during long-duration workouts and races not only being acceptable but highly recommended. So if you’re ready to lift ALL of your workouts and races to another level of excellence, you’re ready for Fully Charged. **EN**





INTERNATIONAL DISTRIBUTORS SUMMIT

The Hammer Nutrition Global Family gathered in Whitefish, MT this spring for our 2nd Annual Summit. Brian Frank led a week of discussion about the Hammer brand and how to provide superlative products, free education, and 5-star service across the world. The countries represented were Canada, Mexico, Chile, Costa Rica, Malaysia, South Africa, Hungary, Czech Republic, Switzerland, Slovakia, Ecuador, Germany, Netherlands, Austria, and the United Kingdom.



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The Santa Cruz Ironman 70.3 was **Jen Reschke's** second top 10 pro finish of the year. Enduring the California summer heat, she held on to 9th place Pro Female thanks to **Fully Charged** before, **Hammer Gel**® and **Endurolytes**® Extreme during, and **Recoverite**® after the race. Photo: Neil Gallivan

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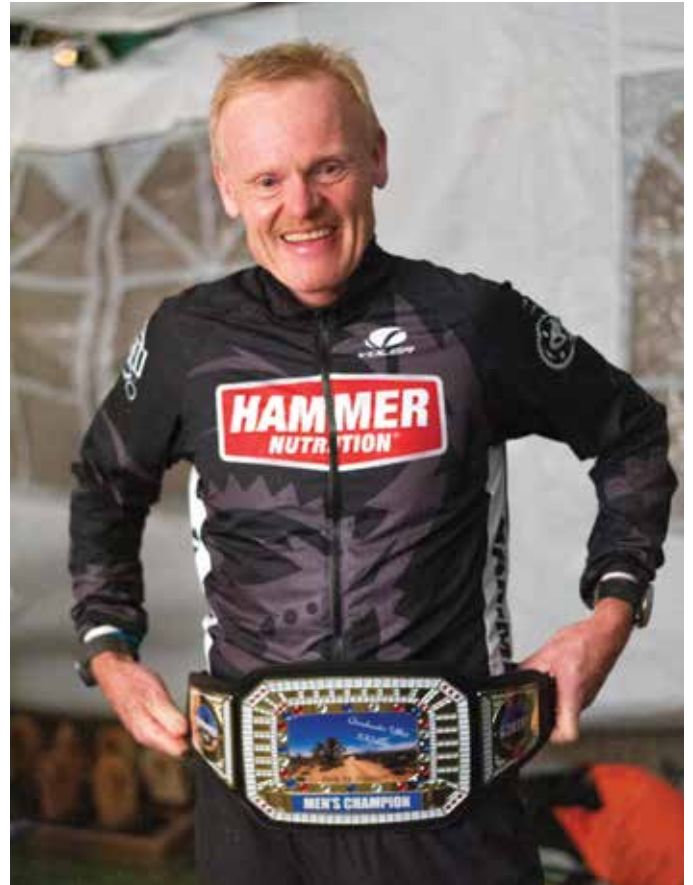
CRAIG HERTZ

OSCR 50K 1st place OA

Craig Hertz kept his speed steady on the slow, wet snow at the OSCR in Seeley Lake, Montana, just down the road from Hammer Nutrition Headquarters.

*“I carried a waistbelt water bottle carrier with 24oz. of **Lemon Lime HEED**, and for fun, put a scoop of **Fully Charged** in for a little extra oomph! Great taste combo!”*

With his fueling dialed in, Craig could fully concentrate on a hard 50K race with 4000ft of elevation gain in soggy conditions, which he managed perfectly and took 1st overall with about 15 minutes ahead of second place.



TOR GUDMUNDSEN

Grand Masters 100 1st place OA

With his daughter Erica ensuring he got all of his supplements and fuels in time—**Tissue Rejuvenator**, **Endurance BCAA+**, **Anti-Fatigue Caps**, and **Endurolytes Extreme** before the race, **Fully Charged**, **Espresso Hammer Gel** at the start, **HEED**, **Hammer Gel**, and **Perpetuem** throughout the race, and **Recoverite**, **Tissue Rejuvenator**, and **Endurance BCAA+** right after the finish—Tor enjoyed steady energy throughout the whole race and finished the Grand Masters 100 miler first place overall and received the title belt along with sub-24 buckle. He covered the 100 miles in 18:43:40. Photo: Mike Allen



CHRIS CURTIS

IBJJF 1st place Division and Absolute

Using his favorite combination of **Fully Charged** and a **Hammer Gel** before the tournament and sipping on **HEED** before and between matches allowed Chris Curtis to stay on top of his performance and win both his division and the absolute at the IBJJF tournament.



JOHN KELLY Montane Spine 1st place at 87:53:57 Photo: Mick Kenyon / Racing Snakes

Barkley Marathon finisher and experienced ultrarunner John Kelly conquered another major challenge across the pond by winning the Montane Spine Race. John started the race at a fast clip in the hopes of claiming a lead over other notable competitors like Eoin Keith and Eugeni Rosello. He powered his run with his reliable combination of **Chocolate Perpetuem**, a combo of **Raspberry** and **Peanut Butter Chocolate Hammer Gel**, and the occasional **Hammer Bar**. Over three and a half days after he started, John crossed the line more than eight hours ahead of the second-place finisher.



LISA WAWRZYNOWSKI

King of Pain 1st place AG, 10th Female OA

With the GPS clocking 1000-1200ft of elevation gain over 10 miles, the name of the race speaks for itself: “King of Pain” in Glastonbury, CT. With her fueling dialed in with **Race Caps Supreme** leading up to the race, a **Hammer Gel**, **Fully Charged**, and **Anti-Fatigue Caps** right before the race, two **Hammer Gels** during, and **Hammer CBD** and **Recoverite** after, Lisa Wawrzynowski confidently landed on the top of the podium shaving 7 minutes from her last year result.

“I didn’t feel fatigued or hungry during it and actually finished strong, passing a few people in the last mile. I was back in the gym the next morning doing leg work with no issues!”



CAITLIN LEWIS

Arches Ultra 1st place AG, 3rd Female OA

Despite slick muddy conditions, Caitlin Lewis powered through the Arches Ultra in Moab, Utah on a snowy January day. To keep her body in tone, and finish strong, she used **Endurolytes Fizz** and **Perpetuem** accompanied by **Race Caps Supreme** and **Tissue Rejuvenator** throughout the race and got her well-deserved first place in the age group and third place overall female.



268 Miles in under 88 Hours

John Kelly kisses the wall after winning the Montane Spine Race over eight hours ahead of the next finisher. John used **Chocolate Perpetuem** as the cornerstone for his fueling plan for the entire race. After multiple navigation errors, John rocketed into a commanding lead during the second half of the race. He finished crossing 268 miles of the British countryside in 87:53:57.

Photo: Mick Kenyon / Racing Snakes

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Matt Trethric, team Hammer Nutrition/53x11 placed 5th AG at Patterson Pass Road Race. Photo: Katie Miu

