

RACE DAY SUPPLEMENT/FUELING STRATEGIES FOR ADVENTURE RACERS

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As a long time ultra marathon cyclist, having done the Race Across America (RAAM) several times, I can appreciate the difficulties of a multi day event. Day after day, night after night, in addition to taking care of the job at hand (whatever discipline is currently being required), as an adventure racer you still have to make sure your fueling needs are taken care of. Unlike ultra marathon road cycling, where you have a support crew to work with, most adventure races require the athlete to be self-sufficient the majority of the time. This means that you have to deal with the logistics of carrying enough food without being unnecessarily weighed down and potentially hindering overall performance. One of the goals in this protocol is to offer suggestions that allow for sufficient calorie consumption while keeping the actual product (and its weight) to a minimum.

You'll be utilizing a lot of different muscle fibers during the race. Protecting energy levels and lean muscle tissue, by making sure your calorie intake is sufficient, will be crucial to just finishing the race, let alone being successful. Another goal in this protocol is to avoid the potential for performance and immune system hindering free radical damage due to the extreme amount of energy output and oxygen volume intake.

PRE-RACE MEAL AND PRE-RACE SUPPLEMENTS

- ◆ **PRE-RACE MEAL- 75-100 grams from complex carbohydrates. No simple sugars or fiber as well. Avoid whey protein prior to exercise. Complete meal three hours prior to start.**
- ◆ **RACE CAPS-2 capsules one hour prior to start. Athletes under 30 can use Cardio Caps instead of Race Caps.**
- ◆ **ENDURO CAPS- 4 capsules one hour prior to start.**
- ◆ **ANTI FATIGUE CAPS- 2-4 capsules one hour prior to start.**
- ◆ **ENDUROLYTES- 2-4 capsules one hour prior to start.**

PRE-RACE MEAL- Everyone has their own personal regimen when it comes to their pre-race meal. I believe it's best to complete a pre-race meal three hours prior to the race to help prevent any potential stomach distress. A four to five scoop serving of SUSTAINED ENERGY, an easily digestible source of carbohydrates and protein, provides 97-121 grams of carbs; enough to sufficiently raise blood glucose levels. Studies by Dr. David Costill have shown that enhanced glycogen storage in muscle tissues and optimal blood glucose levels will enhance performance (you have more in your reserves!). Also, the amount of protein in a serving of SUSTAINED ENERGY is sufficient to begin helping with preventing muscle tissue catabolism, which will be a critical factor in a lengthy adventure. It's a perfect pre-race meal.

Within a few minutes of ingestion of carbohydrates insulin is secreted as a natural reaction from the body. In simple terms, insulin is a type of "sugar-carrier" to the cells. Its function is to aid in transporting glucose from the blood stream into various tissues in the body, mainly the muscles and liver. It's a simple sounding process but like most bodily functions, the intricate processes behind it are anything but simple.

So perhaps the most important reason behind completing your pre-race meal three hours prior to the event is to allow all the intricate hormonal functions that are a part of insulin secretion and glucose transporting to return to base levels. In other words, we need this time to allow our body to "re-set" itself. Why is this important? It is because if we do not allow this time for our bodies' hormonal functions that regulate insulin to return to normal we will cause our carbohydrate metabolism to increase during exercise. Our metabolism becomes less efficient, using/burning more calories on an hourly basis. This causes us to tap into reserves more quickly which will potentially put us in a deficit sooner than optimal performances would allow. For the adventure racer, this is devastating to performance. If you tap into and deplete your reserves too quickly, you may just find that you've dug a nice big hole for yourself and your performance, one that is difficult at best to recover from. And your teammates won't appreciate that!

Remember that our bodies can only return 240-280 carbohydrate calories an hour back into the energy cycle even though we are burning many more calories than that. A very important part of our performance is determined by our ability to utilize stored fatty acids as energy, which is why we can continue to exercise on so seemingly few ingested carbohydrates during exercise. However, if our hourly carbohydrate expenditure is

increased because of consuming a pre-race meal too soon to the start of the race, we are putting ourselves at a “metabolic disadvantage”.

RACE AND ENDURO CAPS- A dose of 2 Race Caps and 4 Enduro Caps an hour prior to the start of the race will help ensure the proper and most efficient use of oxygen for the manufacture of ATP and to delay production of excess lactic acid during the race while providing antioxidant benefits. Athletes under 35 can substitute **CARDIO CAPS** for **RACE CAPS**. Ultra distance athletes will be requiring the substrates in **RACE CAPS** and **ENDURO CAPS** not only for the creation of ATP (and will be depleting these substrates during the event) but for antioxidant protection as well. So supersaturating the tissues with these critical nutrients will help provide ample amounts for both energy production as well as additional antioxidant protection...before they're needed or used up.

ANTI-FATIGUE CAPS- Ammonia sucks and the longer you're out there, racing hard, the more you'll agree with me on this one. If you've ever finished a workout or a race smelling of ammonia, you need to address this issue because, along with increased acidity, it's hurting your performance. During exercise, the body produces ammonia. It doesn't matter what type of exercise you do, aerobic or anaerobic (or both, which seems to be what adventure racing is all about), you will still produce lots of ammonia. It's unavoidable. One well known expert has stated that, "ammonia is toxic to all cells, reduces the formation of glycogen, and inhibits the energy cycle." A study by Drs. JE Wilkerson, DL Batterson, and SM Horvath examined the changes in blood ammonia levels in humans during exercise and determined that the higher the blood ammonia, the poorer performance will be.

So one way to fine tune performance is to minimize the production of ammonia and reduce its accumulation. **ANTI-FATIGUE CAPS** combines the following nutrients, all to support the body in the removal of excess ammonia:

◆ **Magnesium/Potassium Aspartate.** One well-known nutritionist says it best regarding aspartic acid, “Because aspartic acid increases stamina, it is good for fatigue and plays a vital role in metabolism. It is good for athletes and helps to protect the liver by aiding in the removal of excess ammonia." Studies (Agersborg and Shaw 1962, Hicks 1964, Gaby 1982) have shown that this combination provides substantial benefits in the prevention of fatigue. Aspartic acid also combines with other amino acids to form molecules that absorb toxins and remove them from the bloodstream, aids the function of RNA and DNA, and helps to protect the liver. Additionally, with **ANTI-FATIGUE CAPS**

you'll get more consistent energy due to the conversion and increased production of a key substrate, oxaloacetate.

◆ **L-Citrulline.** Citrulline is an amino acid that is found plant foods such as onions and garlic. Citrulline detoxifies ammonia and, like aspartic acid, is used in the treatment of fatigue. It promotes energy and stimulates the immune system. Citrulline combines with aspartic acid to form arginosuccinic acid, which later is metabolized into the amino acid arginine. In a recent Journal Of Endurance (J.O.E.) Dr. Misner discusses the role of arginine and the role it plays in the reduction of free radical damage and enhanced aerobic endurance.

◆ **OKG.** Both ornithine and alpha-ketoglutarate (OKG) provide a readily available, non ammonia-producing source of glutamine in the body. Glutamine is depleted at high rates during exercise but cannot be replaced with regular glutamine as it creates excess ammonia on its own. OKG increases the amount of glutamine in the muscle and also helps prevent muscle catabolism. Colgan writes, "Both ornithine and alpha-ketoglutarate act in the body as an ammonia scavenger."

ENDUROLYTES- I've found that supplementing with 2-4 capsules of ENDUROLYTES one hour prior to a race really helps prevent cramping problems by providing the body with the minerals it needs before it needs them. In essence it's a "pre-emptive strike" of sorts and for the adventure racer this may be quite necessary due to the fact that your first leg of the race may not allow you to replenish electrolytes until you're too far (too late?) into it. The chelated minerals in ENDUROLYTES are necessary for ensuring that the muscles contract and relax properly and efficiently. They are also responsible for helping the heart beat rhythmically and for keeping the nervous system functioning at optimal levels. The potential for cramping in adventure racing, with so many athletic disciplines being required (recruiting a lot of different muscle fibers) in all sorts of weather conditions has got to be almost inevitable. So even if you've never cramped before, why take chances come race day? Providing the minerals you need to ensure the muscles, heart, and nervous system are working optimally is definitely a wise strategy.

DURING THE RACE

APPROXIMATELY 250-350+ calories per hour from:

- ◆ **SUSTAINED ENERGY- 2-3+ scoops per hour. For convenience a bottle of 9 or more scoops can be made and “nursed” for several hours.**
- ◆ **HAMMER GEL- 2-3 servings on its own, alternating with Sustained Energy or mixed with appropriate amounts of Sustained Energy to achieve calorie requirements.**
- ◆ **RACE CAPS/ENDURO CAPS- 1 Race Caps, 2 Enduro Caps every hour after the third hour.**
- ◆ **ENDUROLYTES-2-5 capsules every hour**
- ◆ **ANTI FATIGUE CAPS- 1-2 capsules every hour after the third hour**
- ◆ **SUPER AO- 1 capsule every 3 hours**

This is where things get a little tricky. Chances are, you won't be able to carry a full supply of food with you. Certainly not enough to last you for the several days it takes to complete an adventure race. Hopefully there will be food drops available to you so that you can re-supply the amounts of food you are able to carry with you.

In addition, while it's important to try and take in consistent doses of supplements, I know it may not always be possible. In addition, I realize that you'll be going through sections of the race that will see you getting quite wet, if not completely soaked. Wet pills are useless so you will need to find a way to keep them dry.

But let's start with fueling. It will be important to maintain consistent energy levels by supplying ample calories. Solid food is certainly acceptable and sometimes may be your only choice at any give time during an adventure race. But getting quality calories from solid food is not always possible. You'll want and need fuel that's available in an easily digestible form. And don't fall for the same mistake I have in the past that many are still making today by trying to replace the same amount of calories you're “burning” on an hourly basis. Yes, you may be using up 400-500 calories or more an hour but your body cannot replace those in equal amounts on an hourly basis. The body can only process a given amount of calories an hour and to force additional food down, in the hopes of “topping off” or “getting ahead of” calorie needs, will usually backfire. Instead of having

more calories available for fuel, they will sit in your stomach causing, at the very least, bloating, at the most, nausea and vomiting. Few things will slow you down faster or cause you to have to stop than taking in more calories than your body can handle. It's much better to listen to your body and not get caught up in the idea that mega-calorie intake is ideal. Even the leanest of athletes has several thousand calories available in the form of stored fatty acids, most carrying nearly 100,000 calories of energy from their stores of fatty acids. As mentioned above, a very important part of our performance is determined by our ability to utilize stored fatty acids as energy, which is why we can continue to exercise on so seemingly few ingested carbohydrates during exercise. Part of the benefit of training is utilizing these stores more efficiently and during the race the body will rely more on these stored fatty acids to provide fuel.

The primary source of muscle energy production is Adenosine Triphosphate (ATP). Each muscle stores its own supply of glycogen, which is a long-chain carbohydrate having a chemical structure similar to the carbohydrates found in a common potato. When we exercise the body has a remarkably easy time of breaking down muscle glycogen into ATP than either fat or the limited amounts of protein donated from lean muscle mass. However, after 90 minutes, and becoming more important the longer a workout session or race is, the body will require protein for fuel as carbohydrate reserves are reduced. This metabolic process, called gluconeogenesis, allows for the synthesis of glucose from protein (along with the glycerol part of the fat molecule). The body will cannibalize protein from muscle tissue if adequate amounts of protein are not ingested. This process not only deteriorates lean muscle tissue but hampers fat burning capabilities and speeds up the production of ammonia. If you want to give yourself the best possible chance on finishing the race, you need fat burning capabilities to operate at maximum efficiency and you definitely don't want any more ammonia. Make sure carbohydrate intake is consistent and that some protein is consumed during endurance exercise, 10-15% of total calories is suggested. In addition, it is believed that soy protein is the preferred choice during exercise as it has less chance of producing ammonia than whey protein. This is why SUSTAINED ENERGY was made! It provides a proper balance of complex carbohydrates and soy protein, and contains nutrients that buffer excess lactic acid and help access body fat stores more efficiently (so they can be used as fuel). It's the perfect choice for fueling any 2 hour plus endurance activity.

SUSTAINED ENERGY is guaranteed not to upset your stomach, which is a definite plus during an adventure race. I highly recommend it on an hourly basis, as often as is practical. Still, hour after hour in any endurance event is a long time to go on just one product, no matter how good it is. Alternating with any of the many flavors of HAMMER GEL (or flavoring SUSTAINED ENERGY with HAMMER GEL) provides many different flavor possibilities. Solid food choices should be ones you're already familiar with using in training (avoiding the local "cuisine" is definitely a good idea). And at night, the small hit of caffeine from the Espresso flavored HAMMER GEL (the only flavor

containing caffeine) can really come in handy. Mainly though, no matter what you choose to eat, **AVOID SIMPLE SUGARS AS MUCH AS POSSIBLE!** Stay away from the sports drinks that are flavored with sucrose, glucose, or fructose; they simply cannot provide the calories you need because they need to be extremely diluted in order to simply pass through the GI tract. If a product sits in your stomach it can't do you any good and will more than likely cause stomach distress...not good for performance! Products containing simple sugars should be avoided because once they do get absorbed into the bloodstream they will cause an excess burst of insulin. This excess insulin causes that all too familiar "spike". More than likely we've all experienced this quick burst of energy followed by the ensuing "crash" characterized by fatigue, lethargy, and mood swings (can you say "bonking"?). Seriously, you've put so much work into training and preparations; why put junk in your body when it's time to race? The above may have been a lot of reading but your choice of fuel is what is going to get you through the race. Choose wisely!

The problem the adventure racer faces is how to get the most fuel in the least amount of space with the least amount of weight. A good way to do this is to make a super concentrated mix of **SUSTAINED ENERGY** in a 36 ounce Nalgene bottle. You can mix 12-15 scoops in this container, which will provide 4-5 hours or more of fuel. More than likely you'll have another bottle or Camelback, which should be filled with clean water. Alternating sips of highly concentrated **SUSTAINED ENERGY** with water from another source will sufficiently dilute the mixture and allow you to enjoy water as your primary fluid.

And for additional calories in a small space, why not carry a full jug of **HAMMER GEL**? You'll have 2,600 calories of pure carbohydrates in one jug, easily sufficient for 8.5 or more hours of racing. As the amount of gel in the jug diminishes, you can add water to the remainder and have an additional reservoir of fluid (and a darn good energy drink to boot!)

RACE and ENDURO CAPS-Every ultra marathon race I've done in the past few years I've used a "1 **RACE CAPS**, 2 **ENDURO CAPS**" hourly regimen with very good success. The substrates that make up these products are critical for the cellular respiration process of creating ATP, our body's energy, but are used up rapidly during exercise. Replenishing them on an hourly basis will give your body the substrates it needs so that it can continue to efficiently make fuel from the food you eat and the oxygen you take in, definitely a bonus during an adventure race.

ENDUROLYTES- Remember, there isn't a sports drink available that will provide sufficient amounts of electrolytes (or calories) for an athlete competing in an adventure race. During changes in the weather, your calorie needs may vary only slightly while your electrolyte needs increase greatly. So even if there were a sports drink that contained enough electrolytes, it would be impossible to alter the mixture during the race to match your particular electrolyte needs. What you're going to need at 3:00 in the afternoon is going to be different than at 3:00 in the morning, if only due to changes in the weather. This is why I believe it's essential to provide these vital minerals from a source that allows you to alter the dose on an "as needed" basis.

Secondly, contrary to the belief of many, sodium while necessary as an electrolyte, cannot fulfill electrolyte needs on its own. Proper muscle, nervous system and digestive function, fluid balance, and heart rhythm are dependent on a variety of electrolytes, not just sodium. Additionally, dumping too much sodium back into your body will over ride normal body mechanics that involve sodium replacement via the kidneys. This is often manifested in swelling of the feet, ankles, hands, and wrists as well as being a primary factor in severe stomach discomfort. Neither of those things will help your performance! ENDUROLYTES uses a precise ratio of the electrolyte minerals your body needs (not just sodium) in a highly bio-available chelated form to help prevent heat-related problems such as cramping and to ensure optimal functioning of many body systems. Because you're going to be out there a long, long time the potential for cramping is very real. With an ample hourly dose of ENDUROLYTES you can make this a completely preventable problem while ensuring many of the vital body functions are operating at full potential. You and your teammates can make this hourly dosing extremely easy by simply carrying a whole bottle (120 capsules) or two with you and sharing from them.

ANTI-FATIGUE CAPS- The longer you race, the more ammonia your body can potentially produce. It's a factor in fatigue so anything you can do to rid your body of any excess amounts can only help promote better performance. One or two capsules an hour can be a real ally in preventing premature fatigue from setting in.

SUPER AO- I admit, I've never used this product during a race...I just never thought of it at the time (my last big race was October 1999). But I decided to try it with a couple athletes I was working with who were also doing ultra cycling events. Their response after the race was that the anti oxidant, anti-inflammatory and circulatory benefits really seemed to help prevent excess muscular soreness. This wasn't just an isolated case either; I heard back from more than a half dozen athletes who all had favorable responses from the occasional capsule of SUPER AO. Is it "absolutely essential"? Perhaps not. But I sure wish I had been using it during my ultras back then. A little extra of the above listed benefits can't hurt and may definitely help!

Having hourly doses of RACE CAPS, ENDURO CAPS, ANTI-FATIGUE CAPS and SUPER AO already put together in small zip lock baggies can save a lot of time and hassle while still allowing you to get all the benefits of these products.

POST RACE NUTRITION AND SUPPLEMENTS

- ◆ **HAMMER PRO/HAMMER GEL-** 1-1.5 scoops HAMMER PRO, 3-4 servings HAMMER GEL in water, milk, soy milk **OR:**
- ◆ **SUSTAINED ENERGY-** 3-4 scoops in 24 ounces water

- ◆ **PREMIUM INSURANCE CAPS-** 1 full packet (7 capsules)
- ◆ **SUPER AO-** 2 capsules
- ◆ **OMEGASOURCE-** 3-5 capsules

OK, I know the last thing on your mind after a tough race could very well be making sure you get the right food and supplements in your system as soon as possible. But before you break out the beers and celebrate, take some time to take care of the body that has served you so well during the race.

HAMMER PRO- 1 scoop will provide 18.5 grams of whey protein, which is considered the best choice for recovery. Consuming protein right after a workout or a race will accelerate the muscle tissue rebuilding process while also protecting the immune system.

HAMMER GEL- 3-4 servings will provide nearly 75-100 grams of complex carbohydrates for the replenishment of muscle and liver glycogen stores.

SUSTAINED ENERGY- The alternative and perhaps simplest way to meet post-race protein/carbohydrate requirements. 4 scoops will provide 97 grams of carbohydrates and 14 grams of protein. You may want to add a bit more protein, perhaps another 8-10 grams to obtain the 4:1 ratio that is believed to be the best ratio of carbohydrates to protein.

PREMIUM INSURANCE CAPS (PIC)- One full packet (7 capsules) will replenish the body's stores of essential vitamins and minerals including the vital antioxidants.

SUPER AO- This is perhaps the strongest non-vitamin antioxidant formula available. Intense exercise increases free radical production dramatically. To protect the body's cells and to promote accelerated recovery, sufficient antioxidant intake is critical. This product compliments the antioxidants found in PIC perfectly and even though you may have been using it during the race, it'll be important to maintain antioxidant status after the race as well.

OMEGASOURCE- The main benefit of taking this product after the race is to provide anti-inflammatory support. Your body will thank you for it!

Steve Born is a technical advisor for E-CAPS with over a decade of involvement in the health food industry. He is a three-time RAAM finisher, the 1994 Furnace Creek 508 Champion and 1999 runner-up, and is the holder of two Ultra Marathon Cycling records.

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