

## **ENERGYbits® can Prevent or Correct Iron Deficiency & Anemia in Endurance Athletes**

Training for and competing in a Triathlon is an enormous physical challenge. Imagine if that challenge were made even more formidable by having to endure vexing symptoms such as lack of endurance, persistent fatigue, a higher heart rate during exercise, irritability, and a noticeable reduction in your motivation to train.

Faced with these symptoms, your first instinct might be to assign blame to overtraining or perhaps not enough carbohydrates to meet the muscle fueling demands of your workouts. So you make the necessary adjustments to your recovery and you eat more carbs. But those same debilitating symptoms persist.

### **What could be the culprit?**

One possibility is low iron, resulting in iron deficiency anemia. This preventable condition can develop over time and rob you of your ability to work out and compete at your best. This article explains iron deficiency anemia, how it develops, who is most at risk and why - and, most importantly, simple steps you can take to prevent it.

### **Endurance Athletes Need Iron**

As a triathlete, you push your body virtually every single day. It's your muscles that power you as you train in the water, on the bike, and on your feet. Your muscles depend on a constant supply of energy and oxygen. The mineral iron turns out to play a key role in both energy production and the delivery of oxygen throughout the body.

Cells, including muscle cells, require energy in order to function. Without this energy, your muscles would simply shut down. The energy powerhouses found in cells are called mitochondria, and iron is a critical player in allowing these energy-producing biological structures to produce the metabolic energy needed for the muscle contractions that enable you to exercise. Your hard-working muscles also require oxygen. Here again it is iron, this time in partnership with red blood cells in the bloodstream, that participates in getting much-needed oxygen to muscle tissues. Red blood cells get the credit for making these all-important oxygen deliveries, but it's a protein bound to iron and found in red blood cells - called hemoglobin - that is responsible for binding to oxygen in your lungs and then releasing it to tissues, such as your muscles, that require it.

### **Iron Deficiency Anemia Deconstructed**

Iron is an essential nutrient. That means your body can't make it and you have to get it from your diet. But if you don't consume enough iron to meet your needs, over time, iron deficiency anemia can develop. Anemia is a condition where the blood's ability to transport oxygen is reduced. While there are many types of anemia, and just as many causes, a common

type is iron deficiency anemia; when it occurs in athletes, it has debilitating effects on athletic performance.

Iron deficiency anemia doesn't develop overnight. Instead, depletion of iron occurs in stages. It starts when an individual consumes too little iron to meet their daily needs. When this happens, the body is forced to rely on its reserves, and gradually stores of iron in the body become depleted. In the absence of adequate iron stores, red blood cells continue to form, but they are small in size and contain less-than-normal amounts of hemoglobin. Red blood cells have a lifespan of about 120 days. So gradually over time the new less-than-optimal red blood cells that are smaller than normal and low in hemoglobin replace more and more of the older, normal versions. Unfortunately, the ability of these newly formed cells to carry oxygen is impaired. As a result, during exercise your heart has to beat faster to try to keep up with the metabolic demand for oxygen. But it's a losing battle. With suboptimal oxygen delivery, neither your brain nor your muscles can function at their best. The end result is lagging motivation to exercise, feelings of irritability, persistent fatigue, and overall poor endurance. Needless to say, Ironman Triathlons and iron deficiency anemia do not make for a good combination.

### **Problematic in athletes**

Iron deficiency anemia is the most common nutrient deficiency condition in the world, so it's not a problem that is exclusive to athletes. But its detrimental effects are quite apparent in athletes. According to an expert in the field, being an athlete definitely shines the spotlight on the condition if it is present. In fact, an individual who is not very physically active might not even be aware that they have anemia, whereas an individual who trains hard and tries to get the most out of their body on a daily basis will clearly notice a difference in physical performance as iron deficiency anemia takes hold.

Being a triathlete puts a stress on your iron stores in a number of ways. For example, when you train and compete, you sweat a tremendous amount in order to cool yourself. With each drop of that sweat, a tiny amount of iron is lost. Endurance athletes also have a reduced flow of blood to the digestive tract during extended exercise, and this can be accompanied by some gastrointestinal bleeding. Any time you lose blood, you lose the iron associated with hemoglobin in red blood cells. Many triathletes take aspirin or other pain-relieving or anti-inflammatory medications, and these too can cause blood to be lost via the gastrointestinal tract. Finally, the physical impact of running is believed to take a toll on iron stores. Experts call the phenomenon foot-strike hemolysis. The idea is that as your feet pound the pavement when running, the impact causes red blood cells to burst, and the iron inside these cells is then lost. These effects of exercise aren't enough to cause iron deficiency anemia, but the depleting effects can compound the problem if your iron stores are already low to begin with.

### **Triathletes at highest risk**

While exercise itself increases the daily need for iron a bit in virtually all endurance athletes, some athletes are more at risk for iron deficiency anemia than others. Those with either higher needs for iron, lower iron intakes, or a combination of both are at highest risk.

Women athletes of reproductive age are at the top of the high-risk list. Two things are working against you if you fall into this category. The first is that monthly menstrual blood loss, while completely normal, can be a big contributor to iron depletion. In fact, because of menstrual blood losses, women of childbearing age require about 18 mg of iron from the diet on a daily basis, while men require only about 8 mg of iron daily. That's just half the story. Men not only have lower iron needs, they consume more calories or food on a daily basis, and so they usually easily meet their iron needs. Women, on the other hand, have a greater need for iron, but they typically have to meet their needs while consuming fewer calories than men. Thus, it's all too common that women of childbearing age often come up short on iron and suffer a disproportionate share of iron deficiency anemia.

Endurance athletes tend to be at higher risk for iron depletion because the high-carb diet needed to meet the ongoing energy demands of the sport doesn't provide iron with the best bioavailability. Plant-sourced foods such as grains, fruits, vegetables, and beans are chock-full of carbs and other important nutrients, but the iron from these sources is not as well absorbed as iron from meat, poultry, or fish. Vegetarian athletes who rely only on plant-derived foods are at higher risk for iron deficiency for the same reason.

Finally, adolescent athletes undergoing growth spurts also make the high-risk list because they have a higher need for iron to support growth and development. If their daily iron needs go unmet, reserves dwindle and iron deficiency anemia can develop.

### **How to know if you're low in iron**

Full-blown iron deficiency anemia and low iron stores are detected by blood tests. A low hemoglobin level generally indicates that you've reached the anemia stage. You can also be iron deficient with dwindling iron stores yet not have full-blown iron deficiency anemia. Often, physicians will not only test the blood for hemoglobin concentration, they will also test for the ferritin level in your bloodstream. Ferritin is a protein that binds to iron and circulates in the bloodstream. A low serum ferritin level suggests that your stores of iron are low and that you may be headed for iron deficiency anemia.

### **Prevention is the best medicine**

The best way to ensure adequate iron stores and prevent iron deficiency anemia is to consume adequate iron from a natural source (not supplements which can result in toxicity). The best, safest, natural source of iron is **ENERGYbits**<sup>®</sup>, which are 100% organically grown spirulina algae.

### **ENERGYbits<sup>®</sup> the best and safest source of iron**

Unlike iron supplements which can cause toxicity if too much iron has been taken, the iron in **ENERGYbits**<sup>®</sup> is all natural and plant based so the body only absorbs what is needed and automatically eliminates what it doesn't (through sweat and urine). This is in contrast to iron supplements which can easily lead to toxicity. This is one of the many reasons why **ENERGYbits**<sup>®</sup> are the preferred source of iron

ENERGYbits® are 100% organically grown spirulina and have such a high concentration of iron, they contain 40-50 times more iron than spinach and 25 times more iron than beef. As a result, every serving of ENERGYbits® (30 tabs) provides significantly more iron than a serving of either spinach or beef, neither of which can be conveniently carried in a runners pouch like ENERGYbits® can.

The iron in ENERGYbits is naturally chelated (attached) to the unstructured amino acids, which is why the iron is so quickly and easily absorbed. This compares dramatically with the iron in other foods such as spinach which is difficult for the body to absorb. The reason why algae is different is because all the protein (in ENERGYbits®) is in amino acid form which the body absorbs. The iron is chelated (attached) to the amino acids so it is instantly absorbed. This is one of the many reasons why athletes experience a lift of energy when they take ENERGYbits® prior to or during a run. Not only do the amino acids provide critical glucose to fuel their muscles, the iron allows the hemoglobin in their blood to carry larger amounts of oxygen and this greater amount of oxygen in the blood is what prevents muscles and the brain from fatiguing.

Alternative nutritional strategies to get your iron have been suggested by others who are not familiar with algae or it's high concentration of iron. Some of these strategies may help but none of them are as safe, pure and immediate as getting your iron from **ENERGYbits®** and all of them have a downside, while taking **ENERGYbits®** have none.

References:

Clark SF. Iron Deficiency Anemia. Nutr Clin Prac 2008; 23: 128-141. Zoller H, Vogel W. Iron Supplementation in Athletes - First Do No Harm. Nutrition 2004; 20: 615-619; Deakin V. Iron Depletion in Athletes. In: Burke L, Deakin V. Clinical Sports Nutrition. 3rd ed. McGraw-Hill, 2006: 263-312.

**Source:** Christopher D. Jensen, PhD, MPH, RD

*Disclaimer: The information contained here is for educational purposes only and is not recommended as a means of diagnosing or treating an illness.*

Would you like to feel better and more confident that you are getting your nutritional needs met? If so, please consider adding ENERGYbits® to your diet which you can purchase from our websites.

[www.recoverybits.com](http://www.recoverybits.com) [www.skinnybits.com](http://www.skinnybits.com) [www.energybits.com](http://www.energybits.com) [www.vitalitybits.com](http://www.vitalitybits.com)

[www.bitsofhealth.com](http://www.bitsofhealth.com)