

# The Nutrition Nerd's Guide to Eating While Injured

by Denis Faye

If you exercise, there's a good chance you're going to get hurt at some point. Injuries are one of the few downsides to living an active lifestyle. But honestly, it's kind of a small downside. After all, wouldn't you rather twist an ankle instead of catching a bad case of obesity, heart disease, diabetes, or osteoporosis?

And unlike all those inactivity-related illnesses, sport-related injuries tend to heal. If you're smart about, they heal quickly. Conventional wisdom tells us that RICE (rest, ice, compression, elevation) and maybe a little ibuprofen are the best way to deal with most injuries. But the truth is that you have another incredibly powerful tool in your healing arsenal: your mouth.

Well, not so much your mouth *per se*, but rather what you put into it. Let's take a look at how proper nutrition and a solid supplement regime can get you off the couch and back into your groove in no time.



## Anatomy of an injury

The human body can be injured in all kinds of funky ways. Sprains, strains, cuts, bruises, tears, and burns all present in different ways and symptomology varies wildly. That said, there are some basic commonalities when it comes to the way we heal. Injuries tend to be put into two

groups: mild and severe. Mild ranges from a twisted ankle to elective surgery. Severe injuries include major surgery and severe burns. I'm going to talk mostly about the mild stuff.

Wound healing can be broken down into five stages. To explain them, I'm going to throw down some hardcore anatomy and some serious 25¢ words. If that's not your trip, it's all good. Just skip down to the eating part.

**Hemostasis:** First, bleeding is stopped and the wound is isolated thanks to constricting blood vessels (vasoconstriction), clotting, and a scab. These barriers prevent infection and supply structure for the next stages.

**Inflammation:** Prostaglandins and other inflammatory buddies promote the opening up of blood vessels (vasodilation), allowing enzymes, antibodies, and nutrients to enter the wound. White blood cells also head on in, fighting infection and removing debris and bacteria. (Although inflammation is a dirty word in many circles, it's actually quite a useful stage in healing. It's only problematic when it goes on too long, but we'll talk about that another time.)

**Proliferation:** Once the body has managed the injury, this is where the healing truly begins. Collagen-building cells called fibroblasts and blood vessel-building cells called endothelial cells travel to the wound in order to put Humpty Dumpty back together again. (BTW, collagen is the connective tissue surrounding our cells that holds us together. Remember that. There might be a quiz.)

**Contraction:** This is when the wound starts shrinking. Cells called myofibroblasts are in charge of pulling the wound together. (By now, you probably notice that every stage of healing includes some sort of energy expenditure. That's another potential quiz question.)

**Remodeling:** At this point, you're basically healed. Collagen isn't being built as much as it's being reworked and strengthened. This phase can take years.

## Now, about the eating thing

First, let's get one thing straight. This is not hippy advice. I understand that the hippies tend to think the right foods can cure anything. That's not what I'm about to recommend. This nutritional advice is grounded in hard science—and little bit o' love.

**Calories:** Especially among us fitness and weight-conscious types, there's a perception that you should greatly decrease calories during a healing cycle because you aren't expending calories working out. The clinical term for this kind of thinking is "stupid." In fact, the opposite is true.

Healing takes a tremendous amount of energy—so much so, in fact, that it causes hypermetabolism, meaning you burn extra calories without even working out. (Score!) And because the body views all injuries as life-threatening, your system makes healing its priority, so if you're not eating sufficient calories, your body will resort to "autocannibalism," which is every bit as grizzly as it sounds. In other words, if you don't eat enough, your body will break down amino acids—typically muscle and, in severe cases, also skin collagen and bone—in order to heal.

How many calories you need depends on the severity of the wound, but for the type of injury we're discussing here (mild), the lamely-named journal *Eplasty* recommends the following:

$$\begin{aligned} &\text{Basal Metabolic Rate x} \\ &1.2 \text{ (injury-induced stress factor) x} \\ &\text{activity factor} = \\ &\text{recommended caloric intake} \end{aligned}$$

*(Activity factor is 1.2 if you're not exercising. It's 1.5 or up if you're remaining active.)*

For those of you not into math, that means you should continue to eat at a weight-maintaining level, but don't be afraid to add an extra portion or two or a snack to your eating plan to allot for increased nutritional needs.

### Macronutrients

All of the macronutrients play important roles in the healing process. (Duh.)

**Carbs** matter because glucose (blood sugar) provides energy for healing cells. They also serve several other functions, including playing a key factor in a number of wound-healing enzymes.

**Fat** also works as an energy source and is vital for the creations of inflammatory mediators such as prostaglandins. Furthermore, it's an important ingredient in the creation of new cells, given cell membranes are made of fat.

While these two macronutrients are important, the Grand Poobah here is **protein**. As I stated earlier, protein is comprised of amino acids, the building block in wound healing.

Given all the cells you're tearing down and building up, along with increased enzymatic activity, it's important to increase protein intake during healing phases. *A good number to shoot for is between 1.5 and 2 grams per kilogram of body weight.*

And if you really want to get fancy about it, there are two amino acids to seek out in particular. **Arginine** helps with vasodilation (blood flow) and can be found in soy, sesame seeds, gelatin, turkey, and crab meat. **Glutamine** serves a number of roles in the body, including helping immune cell function. It's been shown to reduce hospital stay lengths in injured patients. You'll find glutamine in meat, fish, eggs, cabbage, and beets—although it's tough to process from vegetable sources unless it's fermented.



### Micronutrients

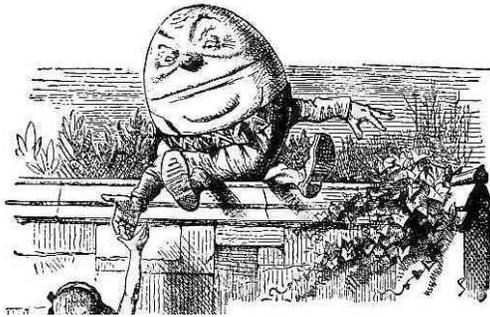
As anyone who's ever had a boo-boo knows, wounds are stressful. With this in mind, antioxidants are a good idea when you're injured to help fight oxidation brought on by inflammation. However, three antioxidants in particular are especially useful: zinc, vitamin A, and vitamin C.

**Zinc** is a trace mineral that plays an important role in DNA and protein synthesis, as well as cell division—three crucial processes for tissue regeneration. Impaired wound healing due to a zinc deficiency is well documented, so make a point of getting at least 15-30mg daily particularly during the early inflammation stage. Good sources of zinc include calf's liver, spinach, crimini and shiitaki mushrooms, as well as

pumpkin and sesame seeds.

**Vitamin A** plays an important role in immune function and has been shown to improve wound breaking strength by helping you build a stronger collagen matrix. (Refresher: collagen holds your cells together.) It also plays an important role during the inflammation phase by increasing inflammation, which sounds bad, but is actually a good thing because, as you recall, inflammation in the early stages of an injury is important for protecting the area. So you'll want to supplement this earlier in the healing process.

Vitamin A toxicity can happen but 25,000mg on a short-term cycle appears to be okay in most non-pregnant adults. (Although if you're a pregnant man, you might be in trouble regardless of vitamin A consumption.) Vitamin A-rich foods include sweet potato, carrots, and most leafy greens (especially spinach).



**Vitamin C**—or ascorbic acid—is an important cofactor in collagen synthesis, meaning it helps the enzymes that rebuild a wounded area. It can also boost immunity. Considering we don't store ascorbic acid, it's important to keep the stuff coming when you're injured. Up to 1-2g daily should do the trick.

**B complex vitamins** play all kinds of roles in wound healing. They act as coenzymes during the inflammation stage and they aid in the removal of dead tissue and bacteria. They aid in the building of collagen, wound constriction, and scar support. The amount you need depends on which B vitamin you're talking about, but a varied, healthy diet should cover you. Foods rich in Bs include potatoes, bananas, beans, chicken, oatmeal, fish, and sunflower seeds. Keep in mind that vitamin B12 comes from animal sources, so if you're a vegan, it's an especially good idea to supplement during wound healing.

### Supplements

For most of us, wound healing is a time for desperate measures—or so it feels. So, as is

typical of these situations, the supplement industry offers no shortage of Hail Mary pass-type pills and potions you can pop. Luckily, some of them actually stand up to scrutiny—and happen to be inexpensive and non-proprietary.

**Glucosamine sulfate** is mainly recommended as a treatment for osteoarthritis because it stimulates the manufacture of key structural components of cartilage. It is my opinion that it can also benefit joint-related injuries in the same way. Some experts also suggest that glucosamine is important for the synthesis of hyaluronic acid, a key player in tissue repair. Try 1500mg daily during the proliferation stage.

**Bromelain** is made up of proteolytic enzymes (enzymes that breakdown protein) derived from the pineapple plant. (Who knew?) It's been shown to have an anti-inflammatory effect on injuries, most likely because it eats up protein-based waste in the wound and inhibits synthesis of pro-inflammatory prostaglandins. At the same time, it promotes the production of fibrin, the stuff that blocks off the wound to protect it during the inflammatory stage. It's useful in the early stages of an injury in order to prevent inflammation from going on too long.

There is no shortage of studies showing the efficacy of bromelain in sports-related wound healing, but by far the coolest is a 1960 study where boxers supplementing bromelain were shown to heal bruises significantly faster than non-supplementing boxers. Typical dosage is between 125g and 500g, three times a day. Make sure to take it on an empty stomach or the enzymes will work on the protein in your food instead of on your wound.

### Anti-inflammatory foods

There are a number of helpful foods in addition to the ones mentioned above when managing an injury—and they primarily focus on inflammation. Foods rich in proteolytic enzymes (including pineapple, papaya, and cheese) and bioflavonoids and antioxidants (both from fresh fruits and veggies) can help, as can anti-inflammatory herbs such as ginger and turmeric.

Omega-3 fatty acids, which you'll find in seafood, flax, chia, and walnuts, are needed for the production of anti-inflammatory eicosanoids. Personally, I've had good results combating inflammation by supplementing fish oil at 8000mg a day. (It also cleared up my skin and made it extremely supple, but that's a topic for a different article entirely.)

On the other hand, arachidonic acid is a

precursor to several pro-inflammatory substances, so if inflammation is an issue, you might want to pull back on animal products in general, but particularly beef, eggs, and dairy. That said, if you are going to eat meat, pasture-raised animals tend to have a higher amount of omega-3 fatty acids. I recommend this given the anti-inflammatory nature of omega-3s might offset the arachidonic acid.

Some experts express concern over linoleic acid, which you'll find in vegetables and seeds, due to the fact that it can be converted to arachidonic acid. As long as the foods you're eating are fresh and raw (if possible), I don't think this is worth worrying about. The benefits of veggies and seeds, where you'll find linoleic acid, far outweigh this concern, especially considering the body converts very little linoleic acid to arachidonic acid.

#### **Beyond nutrition**

Obviously, there are a number of therapies that can aid wound healing. These include chiropractic, acupuncture, therapeutic massage, and active release therapy—a relatively new practice involving the breaking down of scar tissue to promote healing.

If your injury includes some type of open wound, the topical application of **Aloe vera**

has been shown to stimulate both collagen and fibroblast synthesis.

Another thing you can do is **avoid stress**. There are several reasons for this, but in my opinion, the most compelling one is that stress elevates cortisol levels. Cortisol is a hormone that, among other things, increases the breakdown of protein into glucose. As I mentioned earlier, protein is crucial to wound healing, so trying to heal in a stressed state basically pulls your body's proteins in two different directions.

Finally, **don't be a hero**. The best thing for any injury is rest. I know you want to keep moving. I know you don't want to lose all the fitness gains you've made, but if you push an injury too hard, it'll only get worse. You run the risk of turning a one-month annoyance into a lifetime source of chronic pain.

#### **Eating after you've healed**

Just because you feel 100%, it doesn't mean everything is perfect. In fact, the remodeling stage can take up to two years. The bulk of the healing is done, though, so it's safe to return to your exercise-based nutrition routine, just being mindful of protein intake (at least .8g for each kg of body weight), given protein deficiency does inhibit wound healing in the remodeling stage.

#### **Parting thoughts**

I know this seems like a lot to absorb, but truly it's not. I can sum 99% of it up for you in 5 quick points:

- 1. Don't skimp on calories or protein.**
- 2. Take a solid multivitamin to meet increased micronutrient needs.**
- 3. Eat plenty of antioxidant-rich, fresh fruits and veggies.**
- 4. Bromelain and glucosamine sulfate are solid, reputable supplements to consider.**
- 5. Take it easy on your injury and stop stressing.**

Now, go get better! If you have questions or feedback, I'd love to hear from you. Please drop me a line at [info@denisfaye.com](mailto:info@denisfaye.com) or on Facebook at [www.facebook.com/realnutritionnerd](http://www.facebook.com/realnutritionnerd).