

Neglecting This During Fasting Can Unleash Stored Toxins

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STORY AT-A-GLANCE

- › Calorie restriction strategies such as fasting and partial fasting activate powerful metabolic processes that catalyze healing and rejuvenation
- › Most of us are toxic these days, and one of the downsides of multiday water fasting is the detox symptoms, which is an indication your detox pathways may be impaired
- › KetoFasting addresses toxicity by modifying the way you fast, and addressing nutrition that supports your detoxification pathways
- › Fasting triggers autophagy – a natural process that clears out dysfunctional and diseased cell components that would otherwise compromise your health
- › During refeeding, mTOR is activated, triggering cellular and tissue regeneration and growth

This article was previously published April 24, 2019, and has been updated with new information.

In the featured podcast,¹ I discuss my book, "[KetoFast: A Step-By-Step Guide to Timing Your Ketogenic Meals](#)" with fitness expert Ben Greenfield. As the name implies, it's a book about fasting. Where it veers from the norm is in the execution of your fast, and the fact that it's a complete system that starts out with intermittent fasting and a cyclical ketogenic diet, and then goes on to a partial fast instead of a water fast.

Taken together, it forms the basis for a lifestyle that you can live with for the rest of your life, and that will truly help you optimize your health and longevity. And, while fasting is a key component, it's not nearly as restrictive as you might think, because once you're able to burn fat for fuel and start doing this cyclical fasting regimen, you end up feasting — eating with very few restrictions — once or twice each week as well.

Fasting Has a Long History of Use

Fasting has been part of human history for centuries. It was often done for ritualistic purposes, and is still done to this day. But nowadays we also have a large body of science confirming the benefits of fasting for therapeutic purposes. Importantly, calorie restriction activates powerful metabolic processes that catalyze healing and rejuvenation.

The 15th century physician Paracelsus stated that fasting is the greatest remedy, the physician within. In the U.S. fasting gained popularity in the 1800s during the Natural Hygiene Movement. Herbert Shelton popularized it further in 1911.

Today, Dr. Jason Fung is one of the leading experts in the field, and he has written books and conducted a lot of important research into fasting, demonstrating both its benefits and its safety. Still, I became concerned with the release of toxins, which becomes very efficient during water fasting.

Most of us are toxic these days, and one of the downsides of multiday water fasting is the detox symptoms, which in and of themselves suggest your detox pathways may be impaired. KetoFasting addresses this by modifying the way you fast, and addressing nutrition that supports your detoxification pathways.

Fasting Activates Autophagy

One of the magnificent benefits of fasting is that it triggers autophagy — a natural process that clears out dysfunctional and diseased cell components that would otherwise clog the proverbial gears in your system and compromise your health. A

foundational strategy to activate autophagy is to do daily intermittent fasting, where you eat all of your meals for the day within a six- to eight-hour window.

For the remaining 16 to 18 hours, you're fasting. This timing appears to be the sweet spot for autophagy, although, as we discuss in the interview, there may be exceptions where you can get away with fasting for as little as 12 hours a day, but this would typically only apply to athletes.

Research shows that autophagy is significantly increased once you pass the 16-hour mark, and since autophagy is such a significant benefit of fasting, it's important to not cut it too short and miss out on this process. To get the maximum benefit, however, you need to fast even longer, which is where multiday water fasting comes into play.

My KetoFast protocol is essentially a hybrid, designed to optimize the benefits of fasting while making the process as painless and easy to comply with as possible.

Autophagy targets damaged and defective cellular parts, not whole cells (which would be apoptosis, or programmed cell death). These defective cellular parts are marked and shuttled to lysosomes, which in turn destroy them via a process involving NADPH oxidase (NOX), which creates superoxide.

The superoxide combines with nitric oxide and forms peroxynitrite, which breaks down the constituting elements of the cellular parts. Those elements are then recycled in the repair and regeneration phase. That's a simple rundown of the autophagy process, which is what you activate when you fast.

AMPK and Autophagy

Fasting also increases adenosine monophosphate-activated protein kinase (AMPK), which plays an integral role in autophagy. Adenosine monophosphate is the core of ATP, which gives you a clue to its importance for health. The K stands for kinase, an enzyme that attaches a phosphate to the AMP to convert it to ATP.

AMP is a nutrient sensor, so when ATP is low it increases. When AMPK rises, it activates autophagy. It stands to reason then that things that inhibit or lower AMPK will inhibit autophagy, because AMPK is one of the primary signals for autophagy – it puts your body into repair mode.

In doing so, it inhibits the mechanistic target of rapamycin (mTOR), a protein nutrient sensor and a powerful signaling pathway used for anabolism or growth. As you might suspect, AMPK and mTOR work in tandem, sort of like a see-saw, so when one is activated the other is deactivated.

Both are important, but neither should be chronically activated or you'll end up with health problems. For optimal health, you need to cycle in and out of AMPK and mTOR activation so that you rotate through the autophagy and rebuilding phases on a regular basis. One of the best ways to do that is to alternate between feast and famine cycles after you are metabolically flexible.

Nutrients That Inhibit Autophagy

While it's typically recommended to continue taking vitamins and minerals during fasting, it's important to realize there are supplements that will inhibit autophagy and therefore should be avoided during the fasting phase. These include colostrum, glutamine, methylfolate and vitamin B12.

You also need to avoid branched-chain amino acids such as leucine during fasting, as they stimulate mTOR and shut down autophagy. You could, however, use bone broth or collagen, which has virtually no branched-chain amino acids. Even at 20 or 30 grams, collagen will not activate mTOR.

Coenzyme A, a molecule that plays an important role in protein, carbohydrate and lipid metabolism, also inhibits autophagy, so you don't want high levels of it, either, when you are seeking to activate autophagy, as it will inhibit autophagy just like mTOR.

When you are in partial fasting mode your liver produces ketones, water soluble fats that are HDAC inhibitors. Ketones help radically lower inflammation and increase

nicotinamide adenine dinucleotide phosphate hydrogen (NADPH), a reducing agent necessary for anabolic reactions, including lipid and nucleic acid synthesis.

You need NADPH for just about everything in your body. Importantly, it's a reservoir of electrons that your body uses to recharge your antioxidants, including the master antioxidant, glutathione.

Nutrients That Activate Autophagy

Getting back to autophagy, supplements and nutrients that activate autophagy by raising AMPK include:

- Berberine
- ECGC from green tea or wildcrafted apples
- Pomegranate peel extract or pomegranate peel powder
- Organic chamomile tea

I make my own autophagy-activating tea, blending Pau D'arco bark tea, hydroxycitric powder, garcinia powder, quercetin powder, glycine and organic chamomile tea. To mix the teas and powders together, I use a blender and drink it cold. To sweeten it, I use monkfruit sweetener, also known as Lo Han. I only use it on partial fasting days. Greenfield, with whom I previously shared this recipe, turned it into ice cream:

"I just took all the powder, put it in with cacao and six egg yolks, a can of coconut milk, a little bit of collagen for the joints, a little extra sweetener ... and then I blended that and put it in the freezer in a stainless-steel bowl," he explains.

Fasting Triggers Stem Cell Regeneration

Another major benefit of fasting is the activation of new stem cells – cells that can be used to heal and regenerate any tissue or organ. This occurs during the regeneration

phase, once autophagy is again inhibited by refeeding and your body starts rebuilding and replacing all those damaged cells that were cleared out.

Regeneration can be further boosted by doing strength training the morning of the day when you're planning to break your fast. The reason for this is because during fasting, your growth hormone level skyrockets, rising by about 300%.

That may sound paradoxical, since growth hormone typically rises in tandem with IGF-1, and IGF-1 inhibits autophagy. However, during fasting, the growth hormone receptors in your liver become relatively insensitive, so your IGF-1 level actually drops.

So, fasting can in some ways be likened to getting a growth hormone injection and a stem cell transplant, and by incorporating strength training at the right time, just as you're refeeding, you really optimize all these regenerative benefits.

This also includes intestinal stem cell function, which is important for many struggling with leaky gut and other gut issues. When you do KetoFasting or other extended water-only fasts (not just intermittent fasting), it helps reduce gut permeability by stimulating brain-gut pathways and enhancing the integrity of your gut lining.

The Dark Side of Fasting

As mentioned earlier, the main reason why I decided against promoting multiday, water-only fasting is because most people are exposed to high amounts of toxins, and most have impaired detox systems. There are three detox systems. Phase 1 is where your body converts fat-soluble toxins to water. This is typically not a problem as it occurs automatically.

What most people have a problem with is Phase 2, where a molecule, such as methyl group, sulfur, acetyl group, amino acid, glycine or glutathione is attached to the toxin, making it less reactive and easier to excrete. You also need amino acids and proteins to fuel this phase of the process. If you don't have any, you're going to experience side effects related to toxicity.

In short, a five-day water fast could overwhelm your detox system, causing more harm than good. You can get around that by shortening the fast and doing it more frequently, so that through refeeding you're giving your body the nutrients it needs to effectively expel these toxins that are released during the fast.

If you were to do five-day water fasts, it's unlikely you'd do them any more than once a month, which means you'd complete about 12 in a year. Using the KetoFast protocol, on the other hand, allows you to go through this regenerative process anywhere from 52 to 104 times, depending on whether you're fasting once or twice a week.

Collectively, you're going to get far more benefit by doing it more frequently. You may not get as much detoxification and autophagy benefits during any given fast, but because you're doing it more frequently, over time you reap greater gains.

Drawbacks of Long-Term Ketosis

In my book I also discuss the "dark side" of nutritional ketosis, and why it may be inadvisable to stay in unbroken ketosis long-term. Long-term ketosis means you're doing significant and chronic calorie restriction, and the problem with that, especially for women, is that it can cause thyroid impairment. In some cases, you can develop a resistance to your thyroid hormones.

Essentially, it appears your body was not designed for long-term calorie restriction but rather intermittent or cyclical calorie restriction. A significant part of this is because continuous calorie restriction fails to activate and optimize your rejuvenation processes. Fasting primes your body for improvement, and it does this by removing the damaged parts through autophagy.

The rejuvenation, however, occurs during refeeding. That's when your body can rebuild and restore cells and tissues. It's largely the stem cell activation and giving yourself the nutrients and the metabolic activation through strength training that causes this repair, regeneration and anabolic growth.

Summary of KetoFast Protocol

The following is a summary of my KetoFast protocol. It is important to first note that those who are underweight, pregnant, breastfeeding or have an eating disorder should not do KetoFasting.

The first step is to compress your daily eating window to six to eight hours for at least four weeks, meaning you eat all of your calories for the day during those six to eight hours, and for the remaining 16 to 18 hours, you're fasting. This is your base.

Most people will become metabolically flexible after this protocol but you can test your ketones and confirm that you are, especially if you are heavy to start with, or diabetic, as it might take you longer to shift.

Once you've followed this intermittent fasting schedule for a month – or when you have restored your metabolic flexibility to burn fat for fuel – you can move into the second phase, which involves having a single reduced-calorie meal, ideally breakfast, followed by a 24-hour, water-only fast, once or twice a week.

This meal will typically be somewhere between 300 and 500 calories. To determine how many calories you should have at this meal, first calculate your lean body mass by subtracting your percent body fat from 100. (So, if you have 20% body fat, you have 80% lean body mass.)

Then multiply that percentage (in this case, 0.8) by your current total body weight to get your lean body mass in pounds. Next, multiply your lean body mass in pounds by 3.5. This is the number of calories you'll want to eat for that meal.

Nutrient Ratios During KetoFasting

By eating just that one 300- to 500-calorie meal and then fasting for 24 hours, you essentially end up having eaten once in 42 hours. This will effectively allow your body to deplete the glycogen stores in your liver.

Even when you're intermittently fasting for 16 to 18 hours, you still have plenty of glycogen left, but when you fast for 42 hours, glycogen will be completely depleted, sending autophagy soaring. And, you can do this twice a week! Now, what should these 300 to 500 calories consist of? Ideally:

- **Carbs** – Less than 10 grams of net carbohydrates (total carbs minus fiber) so as not to replete your glycogen stores. Primarily, your carbs would then be nonstarchy vegetables, seeds or nuts.
- **Protein** – Half of your personalized daily protein requirement. If you're younger than 60, a general recommendation for your daily protein requirement would be 0.8 grams of protein per kilogram of lean body mass, or 0.5 grams of protein per pound of lean body mass. Let's say your daily protein requirement is 80 grams. For this meal, you'd cut that in half to 40 grams.

The key here is not just lowering your overall protein intake but, rather, restricting your intake of branched-chain amino acids such as leucine, found primarily in meat and dairy products.

The reason you want to restrict branched-chain amino acids at this meal is because they activate mTOR and inhibit autophagy – essentially blocking the very cleanout process you're trying to activate through fasting. An ideal form of protein to include in this meal is collagen, which provides great support for your connective tissue. Chlorella is another excellent protein you can include.

- **Fat** – The remainder of your calories comes from healthy fats such as coconut oil, avocado, MCT oil, butter, olive oil and raw nuts.

After Your Fast, Feast!

The day after you've completed your 42-hour KetoFast is the perfect time to do hardcore strength training, and to load up on your protein. Immediately after is when you'll want to eat that grass fed organic steak and/or whey protein, as now you're in rebuilding mode, so you actually want and need to activate mTOR to build new muscle mass.

As mentioned, mTOR, governs growth and inhibits autophagy. In this way, KetoFasting allows you to really feast twice a week as well, which counters any feelings of deprivation you might have during fasting, and this may significantly improve adherence.

Supporting Your Fasting Protocol With Sauna Bathing

To further support detoxification during your fast, I recommend using a near-infrared sauna, which will help eliminate toxins through your sweat. An entire chapter of KetoFast is dedicated to the use of sauna, with specific do's and don'ts.

A near-infrared sauna with low electromagnetic fields (EMFs) can cost several thousand dollars. However, you can make one inexpensively yourself. Aside from the fact that near-infrared bulbs heat you up more effectively than far-infrared saunas do, near-infrared light (660 and 850 nanometers) also stimulates nitric oxide release and ATP production.

I do a 30-minute sauna just about every day that I'm home, followed by cryotherapy (cold thermogenesis) – essentially, I just jump directly into my unheated pool. An alternative would simply to rinse off in a cold shower. If you're brave, you could do an ice bath.

Sources and References

- ¹ [Bengreenfieldfitness.com KetoFasting](https://Bengreenfieldfitness.com/KetoFasting)