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Take Control of Your Health

Lowering Calories by Just 14% Enhances Your Health

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STORY AT-A-GLANCE

- Data show a cost-effective means of reducing weight, improving your immune system, lowering inflammation and supporting antiaging processes is caloric restriction by 14% of your normal daily intake
- Fasting is one way to lower your calorie intake and experience the additional benefits of stimulating your metabolism, lowering blood pressure and helping to prevent or eliminate Type 2 diabetes
- There are simple hacks that help make fasting easier, which include increasing your ketones to shift your hunger hormones and structuring water so it can be immediately used for energy
- Adding enough prebiotic fiber to your diet supports beneficial gut bacteria and increases the production of butyrate, which is pro-ketogenic. Timing your meals so you don't eat late at night is another strategy to protect your metabolism and health

A study published by Yale University demonstrated a simple, efficient and cost-effective method of weight loss was calorie restriction.[1,2] In addition to helping control an ever-expanding waistline, calorie restriction may also help promote overall health and wellness.

The global business of weight loss is estimated to grow from $254.9 billion in 2021 to $377.3 billion by 2026.[3] The product and services industry has continued to grow in the last several years, driven by an aging population and rising health concerns.

In a press release published in August 2021,[4] Research and Markets announced the release of the Global Weight Loss Products and Services Market 2021-2026 publication.[5] The study was conducted to detail information on the industry, evaluating consumer preferences and a growing trend to purchase products containing natural ingredients.

Global growth was estimated at a compound annual growth rate (CAGR) of 8.2% during the forecast period. Just two years previously, it was estimated the total U.S. weight loss market had grown 4.1% and forecasted to grow 2.6% annually through 2023.[6] The growth in the weight-loss industry matches the epidemic of obesity that faces the world. According to World Obesity,[7] the challenge is now more common worldwide than undernutrition.

Data from the National Health and Nutrition Examination Survey in 2017-2018, showed 30.7% of U.S. adults were overweight and 42.4% were obese.[8] When moderate calorie restriction extends health, reduces weight and costs less than weight loss products, it pays to learn a few simple hacks I discuss below to make the process run smoothly.

Moderate Calorie Restriction May Extend Health

Decades of animal research have demonstrated that caloric restriction without malnutrition can help delay aging and slow the onset of diseases in multiple species.[9] The February 2022 research used data from the Comprehensive Assessment of Long-Term Effects of Reducing Intake of Energy (CALERIE) clinical trial.[10] There were 200 study participants who established a baseline caloric intake.

A portion of the group was then asked to reduce those calories by 14%. The researchers followed the participants for two years with the overall aim to analyze if caloric restriction could benefit humans.

The researchers noted that animal studies had shown caloric restriction could increase infections, and so they also watched inflammatory markers and the immune response. Senior study writer Vishwa Deep Dixit commented in a press release:[11]

> *"Because we know that chronic low-grade inflammation in humans is a major trigger of many chronic diseases and, therefore, has a negative effect on lifespan … Here we're asking: What is calorie restriction doing to the immune and metabolic systems and if it is indeed beneficial, how can we harness the endogenous pathways that mimic its effects in humans?"*

One of the ways the immune response was monitored was by analyzing the thymus. The gland is located behind the sternum and in front of the heart. It produces T cells, a type of white blood cell essential to the immune system. Dixit says that by the time a person is 40 years old, 70% of the gland is nonfunctional, which is one reason the elderly have a higher risk for infection.

Using MRI, the researchers found that the thymus gland in participants who had limited their caloric intake had lower fat and greater functional volume after two years. This meant the thymus gland was producing more T cells at the end of the two years than it was at the beginning of the study.[12]

After further study, the team found that the changes were in the tissue microenvironment of the thymus gland and not the T cells. The team also studied the adipose tissue at the start of the study, after one year and after two years. The data revealed "remarkable changes" in gene expression of fat tissue that was maintained through the end of the study.

They also looked at the gene controlling PLA2G7, a protein produced by macrophages. Positive changes were observed in those who limited their calories, which was reproduced in an animal model. The researchers wrote, "Specifically, the thymus glands of these mice were functional for a longer time, the mice were protected from diet-induced weight gain, and they were protected from age-related inflammation."[13]

Fasting Stimulates Metabolism and Supports Antiaging

One study published in the journal Nature[14] evaluated the effect of a 58-hour fast on metabolic markers such as butyrate, carnitine and branched chain amino acids. The

team analyzed the blood of participants beginning at 10, 34 and 58 hours. Some of the compounds peaked at 34 hours, while others had not yet plateaued at the end of the hour 58.

The researchers identified 46 substances that changed during the fasting period. In past studies, researchers had only identified 14.[15] The researchers noted that none of the participants was obese, which is known to change markers during fasting. The researchers identified two butyrates that were "nearly invisible" at the 10-hour mark, but had reached "major peaks after 34 and 58 hours of fasting."[16]

Butyrate helps maintain intestinal homeostasis by protecting the intestinal barrier and mucosal immunity.[17] Three metabolites that decline with age include leucine, isoleucine and ophthalmic acid. However, testing reveals that fasting individuals have higher levels of these metabolites which may help increase longevity.[18]

The scientists believe the data suggest that antioxidant production may be a marker of fasting that can "boost production of several age-related metabolites, abundant in young people, but depleted in old."[19] One of the scientists, Takayuki Teruya, commented:

> *"We have been researching aging and metabolism for many years and decided to search for unknown health effects in human fasting. Contrary to the original expectation, it turned out that fasting-induced metabolic activation rather actively.*
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> *People are interested in whether human beings can enjoy the effects of prevention of metabolic diseases and prolonging life span by fasting or caloric restriction, as with model animals. Understanding the metabolic changes caused by fasting is expected to give us wisdom for maintaining health."*

Time-restricted eating appears to replicate many of the metabolic benefits of calorie restriction without restricting calories. Additionally, because it is such a restricted eating window and a person's appetite is reduced, they typically wind up eating fewer calories, anyway, without feeling deprived.

Human studies suggest people with a low-calorie intake overall have a reduced risk for Alzheimer's compared to those eating a high-calorie diet.[20,21] A high glycemic diet is also associated with increased amyloid deposition in cognitively normal older adults.[22]

Fasting May Lower Blood Pressure and Prevent Diabetes

Research data show that fasting may improve insulin sensitivity,[23] reverse diabetes[24] and support your weight management efforts when it's combined with exercise.[25] Data presented at the Digestive Disease Week 2019[26] was gathered from 14 healthy individuals who routinely fasted 15 hours a day from dawn to dusk over 30 days during Ramadan.

Researchers collected blood samples at the beginning, end and one week after the fasting period ended. The samples gathered at the end of the fast showed that the individuals had higher levels of tropomyosin (TPM) proteins, known to improve insulin resistance and reduce the adverse effects of sugar.

An editorial written in Open Heart[27] by noted research scientist James DiNicolantonio, PharmD., discussed the results of several studies that have found repeated episodes of fasting could induce cellular growth of pancreatic beta cells in an animal model. The increased number of islet beta cells induced through intermittent fasting was accompanied by a marked improvement in blood sugar control in these studies.

DiNicolantonio believes these findings could be replicated clinically, which would open the path to reversing Type 2 diabetes in those with "enough discipline and commitment to adopt a lifestyle that would have prevented diabetes in the first place."[28]

Another study[29] evaluated the effectiveness of omitting a meal before an early workout. The researchers discovered those who fasted and then exercised had a negative 400-calorie intake during the day when compared to those who ate and rested or who ate breakfast before exercising.

High blood pressure is also associated with the diagnosis of diabetes, or it can occur independently. High blood pressure is called the "silent killer,"[30] since the only way to

know if you have it is to have it measured.

In 2001, a paper published in the Journal of Manipulative and Physiological Therapeutics[31] evaluated 174 patients with blood pressure of more than 140/ 90, which was the upper limit at the time. They were treated in an inpatient setting with a medically supervised, water-only fast for an average of 10 days.

At the conclusion of the fasting period, there was a refeeding period of an average of six to seven days that included a low-sodium, low-fat, vegan diet. Data showed 90% of the participants' blood pressure dropped below 140/90 with an average reduction in pressure of 37/13. The greatest decrease was observed in the participants who had the highest blood pressure.

Simple Hacks Make Fasting Easier

In this interview, Dave Asprey and I talked about some of the fasting hacks he revealed in his book "Fast This Way: Burn Fat, Heal Inflammation, and Eat Like the High-Performing Human You Were Meant to Be." Asprey is a Silicon Valley entrepreneur and founder and CEO of Bulletproof.com.

As the name implies, the book is about fasting and all the health benefits it provides. Is it for everyone? No, and he will be the first to admit that. But it can benefit most of us — certainly, those of us who are either overweight or obese. Another key benefit of fasting is that it makes your body better at producing energy.

This improves sugar regulation and helps you stave off metabolic dysfunction and the diseases of aging that are associated with it. Asprey notes that if you can avoid cardiovascular disease, cancer, diabetes and Alzheimer's disease, you're probably going to live longer since these are the primary killers.[32]

Fasting also has antiaging benefits because it improves autophagy in your mitochondria and cells, a natural process that detoxifies your body. Asprey explains that some of the key dietary principles for losing excess weight and keeping it off include:

- Getting at least half or more of your daily calories from healthy fats
- Eating the right type and amount of protein
- Avoiding inflammatory foods, including inflammatory vegetables (culprits include lectins and oxalic acid, for example)
- Having periods when you fast (abstain from food)

These principles tie directly into the fasting hacks that he recommends. The hacks include increasing your ketone level, which shifts your hunger hormones. He explains:[33]

> *"Ghrelin will drop at 0.38, so almost no ketones. The hunger that comes with the ghrelin turns off. But there's also a satiety hormone, the one that makes you feel full, which is called CCK or cholecystokinin. CCK, when you hit levels of 0.48, CCK makes you feel full. So, if you can get your ketones up to that level in the morning, then you will not pay attention to food.*
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> *The first step to get your levels up is mycotoxin-free black coffee — the Bulletproof beans are that. I did the original research about this. Anything that causes inflammation is going to make you hungry because inflammation just means the electrons that should be powering your thoughts are going to create inflammation in the body. They must go somewhere.*
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> *These toxins are present in very small amounts. Coffee that has more than five parts per million is illegal to sell in China, Japan and Europe, but it gets sent to the U.S., and we wonder why we get really hungry two hours after we have coffee and why we want sugar in our coffee.*
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> *It has to do with toxins, not coffee itself. The study at UC San Diego is really interesting. They found that the amount of caffeine present in two small cups of black coffee will double ketone production.*
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> *The second way is to make the coffee 'bulletproof.' And what that means is, you take your mycotoxin-free beans and you add some MCT oil. The 8-carbon chain*

(C8) MCT is the correct one. C8 MCT raises ketones four times more than coconut oil. [Then] you [add] butter and blend it or really shake it."

The Importance of Prebiotic Fiber and Meal Timing

The last fasting hack is to make sure you're getting enough prebiotic fiber.[34] According to Asprey, long-term fasting and/or eating a carnivore-like, zero-carb diet for extended periods of time without cycling healthy carbs back in can alter your gut microbiota, which in turn can cause sleep disruptions.

When you feed your gut bacteria with prebiotics, they convert the prebiotics into propionic acid and butyric acid (butyrate), and butyrate is very pro-ketogenic. One of the common questions asked when a person is developing their intermittent fasting schedule is whether they should include breakfast or a late-night snack.

Research from Vanderbilt University[35,36] looked at timing meals and the bearing it has on burning energy. They found that the time of a meal influences lipid oxidation and those who ate a late evening snack had lower fat burning during the night as opposed to those who ate breakfast without a late-night snack.

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