## THE A-Z OF INTERMITTENT FASTING: EVERYTHING YOU NEED TO KNOW





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### Summary

Intermittent fasting (IF) is an eating schedule which alternates between fasting and feeding. You set a time window for eating, eat only within that window and fast the rest of the time.

For example, you may eat only between the hours of 10:00 am and 6:00 pm.

IF is not a diet in the conventional sense, but rather, a pattern of eating.

Certain types of intermittent fasting can be incorporated daily, while others are meant only for longer blocks of 3 to 5 days.

Each style carries its own benefits for metabolism, disease prevention, cellular repair and psychological well-being. In this guide, we'll go through all of the benefits, ways to do intermittent fasting and frequently asked questions.

### What is Intermittent Fasting?

Intermittent fasting recently gained popularity in the ketogenic, weight loss and bodybuilding communities but it's not new.

It has been used therapeutically since the 1900s to treat obesity, <u>epilepsy</u> and diabetes.

Intermittent fasting has historically been a normal part of life for humans and many organisms. It's a way of tapping into the ancient knowledge that already exists within your biology.

Scientists and celebrities alike are popularizing this way of eating.

IF is healthy, with benefits from <u>better brain function</u> to protein sparing weight-loss and cancer prevention, and best of all it's easy.

### **The History of Intermittent Fasting**

Compared to traditional "dieting," fasting is simple and unambiguous. It's always been done. You already unconsciously do IF whenever you skip breakfast or dinner.

Historically, during hunter-gatherer days, our ancestors were in a fasting state while seeking food.

When agriculture was established, civilization came next. But when food was scarce or seasons changed, fasting was still a way of life. Cities and castles stored grain and cured meat for the





winter. Before irrigation, lack of rain meant famine, and people fasted to make their stored food last as long as possible until the rains came back and it was possible for crops to survive again.

Religions flourished in this arrangement of people living closer together, sharing and spreading belief and traditions. And religions also prescribed fasting.

Hinduism calls fasting "Vaasa" and observes it during special days or festivals, as a personal penance, or to honor their personal gods. Islam and Judaism have Ramadan and Yom Kippur, when it's forbidden to work, eat, drink, wash, wear leather and have intercourse. In Catholicism, it's six weeks of fasting before Easter or before Holy Week.







### **The Science of Intermittent Fasting**

The modern era of agriculture and factory-laden "food" (or food-like substances) has completely changed the way humans view and consume food on a daily basis, **leading to the laundry list of health problems that our society faces today.** 

Although IF is an ancient practice, the science behind its many health benefits is just recently being exposed to mainstream society.

When you fast, you basically allow your body to naturally cleanse, repair and regenerate itself for optimal function.

Three of the main health-promoting mechanisms associated with fasting include the metabolic regulation of <u>circadian biology</u>, <u>the gut microbiome</u> and different <u>lifestyle behaviors</u>.

### **Circadian Biology**

Humans (and other organisms) have evolved to develop a circadian clock that ensures physiological processes within your body are performed at optimal times throughout the day[\*].

These circadian rhythms occur across 24-hour light-dark cycles and influence changes in biology and behavior[\*].

Interrupting this circadian rhythm negatively impacts metabolism which contributes to obesity and associated diseases such as type 2 diabetes, cardiovascular disease and cancer[\*][\*][\*].

### This is where intermittent fasting comes in.

Feeding signals seem to be the main timing cue for how your circadian rhythms function and thus control certain metabolic, physiological and behavioral pathways that contribute to overall health and longevity[\*].

Certain behavioral interventions such as (you guessed it!) intermittent fasting can help synchronize your circadian rhythms leading to improved fluctuations in gene expression, reprogramming of energy metabolism and improved hormonal and body weight regulation, all factors that play a vital role in optimizing your health outcomes.

### The Gut Microbiome

The gastrointestinal (GI) tract, better known as the "gut," plays an extremely important role in regulating several processes within your body.



Many functions of the gut (and nearly every physiological and biochemical function in your body) are influenced by your circadian rhythm described above[\*].

For example, gastric emptying, blood flow and metabolic responses to glucose are greater during the daytime than at night.

So, it's likely that a chronically disturbed circadian rhythm can affect gut function contributing to impaired metabolism and increased risk for chronic disease[\*].

The gut microbiome, also known as our "second brain," has been the subject of extensive research in both health and disease due to its profound involvement in human metabolism, physiology, nutrition and immune function[\*].

### Intermittent fasting has a direct and positive influence on the gut microbiome through:

- Reduced gut permeability
- Diminished systemic inflammation
- Promotion of energy balance by enhancing gut integrity.

Research on both the gut and intermittent fasting continues to emerge while the potential for prevention and treatment of diseases is becoming more widely understood [\*] [\*] [\*].

### **Lifestyle Behaviors**

Intermittent fasting is shown to help modify different health behaviors such as caloric intake (ie how much you eat), energy expenditure (how much you move) and sleep.

There's no surprise that these three factors contribute to one of the biggest draws to intermittent fasting today: weight loss.

A recent study showed that increasing the nightly fasting duration to greater than 14 hours **led to a significant decrease in caloric intake and weight** with improvements to:

- Energy levels
- Sleep satisfaction
- Satiety at bedtime[\*]

Intermittent fasting also reduces nighttime eating, which contributes to poor sleep quality and reduced sleep duration leading to insulin resistance and increased risk of obesity, diabetes, cardiovascular disease and cancer [\*] [\*] [\*] [\*].



Fasting puts an adaptive cellular stress on the body which in turn allows your body to cope with more severe stressors that may occur and thus protect against potential disease progressions[\*][\*].

This concept is known as hormesis – when an exposure to a mild stress causes cells in your body to become more resilient against other, more severe stressors.

Think of it this way - what doesn't kill you really does make you stronger!

### **The Many Benefits of Intermittent Fasting**

Unlike fad diets, fasting is not expensive, inconvenient, time consuming, complex or difficult.

### Intermittent fasting is accessible to everyone, all the time.

Diets are difficult.

NPR's Health Poll in 2011 [\*] showed that nearly ¼ of New Year's dieting resolutions are broken in two weeks, and another ½ are broken as January ends.

Dieting involves counting and reducing calories and changing your eating patterns, meal planning, grocery shopping and preparation of every meal.

An estimated 45 million Americans go on a diet each year, yet the Centers for Disease Control and Prevention report that 70.7% of adults aged 20 and over are overweight or obese. Clearly something's not working [\*] [\*].

But intermittent fasting is not a diet.

With IF, you don't strategically reduce your caloric intake. Calorie reduction happens naturally through the smaller window of time during which you eat. It's helpful to make the effort to still eat *enough* calories.

Eating a whole-foods diet is beneficial for everyone, but you don't necessarily have to change what you eat either. This makes IF a good way to lose weight and body fat without shocking your body (or lifestyle) with sudden change.

It's simply a way to eat that promotes fat loss without compromising lean tissue. For the same reason, <u>bodybuilders love IF</u> because they can get leaner *without* losing muscle mass.

Besides helping you sleep better, move more and reducing how much you eat, there are a host of other benefits of intermittent fasting that you won't want to pass up.



Health researchers advocate intermittent fasting for its many benefits, described below.

Fat LossDisease PreventionAnti-AgingTherapeutic BenefitsTherapeutic BenefitsPhysicalSpiritualPsychologicalMental PerformancePhysical FitnessBetter MetabolismBetter Wind and EnduranceIF and Bodybuilding







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Here they all are, with the science that proves them.

### Fat Loss: Intermittent Fasting For Weight Loss

Intermittent fasting helps your body become better adapted to oxidizing fat for energy.

Because of the decreased window of time for eating, insulin levels are lower, allowing adipocytes (fat cells) to release fatty acids.

The lower levels of glucose and glycogen encourage the body to use these fatty acids to generate energy for the body and brain rather than store the fatty acids in fat cells.

#### You use up fat instead of storing it and soon burn what you've already stored.

Adherence is another important factor for IF as a tool for weight loss.

Studies confirm that people regain their previous weight or more, several years after a diet[\*].

Why? They fail to adhere to their diets. That's not surprising, since most diets make long term adherence nearly impossible.

Intermittent fasting is comparably effortless to sustain, reducing calorie intake, inducing ketosis, lipolysis, autophagy and other positive bodily responses that work together toward weight loss.

### Intermittent Fasting for Disease Prevention

Recent studies\_emerge to support the use of intermittent fasting as a means of lowering blood glucose in diabetics and leading to overall improved health outcomes[\*].

In particular, one study published in the *World Journal of Diabetes* found that subjects with type 2 diabetes mellitus implementing short-term daily IF significantly reduced body weight, fasting glucose and improved post meal glucose variability[\*].

IF has been shown to:

- Improve markers of stress resistance
- Lower inflammation and blood pressure
- Improve glucose circulation and lipid levels, leading to a lower risk for cardiovascular disease, neurological disorders (such as Alzheimer's and Parkinson's) and cancer[\*][\*][\*].

### Intermittent Fasting for Anti-Aging

Aging is Western society's public enemy #1, so how would you feel if you stumbled across the secret key to anti-aging?

Well you just did.

The <u>anti-aging capabilities</u> of IF are coming to light as more studies show that it has a profound ability to decrease blood pressure, reduce oxidative damage, improve insulin sensitivity and glucose uptake, and decrease fat mass - all factors that contribute to enhancing health and longevity[\*].

Fasting is one of the biological stressors that triggers autophagy - a process where your body clears out dead or underperforming cells and regenerates and recycles damaged proteins[\*].

Autophagy is extremely important and a natural process that plays a **significant role in preventing diseases such as cancer, neurodegeneration, diabetes, cardiomyopathy, autoimmune diseases, liver disease and much more**.

Many of the benefits of fasting are due to this essential, physiological processes.

### Intermittent Fasting for Therapeutic Benefits

### Physical

Beyond its application for diabetes management, IF is also proven to be as effective as approved drugs for reducing seizures and seizure-related brain damage[\*][\*] and for healing rheumatoid <u>arthritis[\*]</u>.

Additionally, research is beginning to emerge showing positive effects of alternate day fasting on reducing the toxic effects of chemotherapy and decreasing morbidity rates associated with cancer[\*].

### Spiritual

Fasting is a common spiritual cleansing practice that remains an integral part of nearly all religions around the world. It's interesting to think that all of these religions are independent and unique yet they all share the use of fasting to heal and promote wellness.

Some might argue that fasting is usually a practice of penance. That's true, yes, but penance is a means to an end. The end is forgiveness and peace, self-love and well-being.

This observation in itself should represent the power of fasting!



### Psychological

Fasting helps improve willpower through regularly exercising the self-control muscle. When you fast, you are consciously choosing not to eat and therefore taking control of your mind and training it just like you would train your muscles during an intense gym session.

As a result of this training, you learn how to control your own eating and you develop the power to control other aspects of your life as well.

One recent study found that **women who practiced intermittent fasting had positive experiences associated with increased sense of achievement, pride, reward and control**.

Willpower influences your sense of accomplishment and self-esteem through being able to exhibit self-control[\*].

Self-control, as evidenced by many studies-- the most famous was the Marshmallow Test-- is one of the greatest predictors of happiness, success and quality of life.

Breaking your fast also brings an incredible sense of gratitude for food, life and nourishing of your body.

### Intermittent Fasting for Superior Mental Performance

Intermittent fasting improves cognitive function[\*] and helps boost brain power.

As mentioned earlier, IF induces neuronal autophagy which allows your brain cells to recycle and repair themselves for optimal function[\*].

Studies have shown that interference of neuronal autophagy can lead to neurodegeneration causing your brain to function insufficiently and prevent you from performing at your full potential[\*].

Intermittent fasting also increases a protein in the brain called brain-derived neurotrophic factor (BDNF).

This protein interacts with the parts of your brain that control learning, memory and cognitive function. Studies have shown that BDNF helps protect your brain cells and even stimulates the growth of new ones[\*]

IF also triggers ketogenesis, where your body turns to fat for energy, metabolizing fat into ketones. Ketones easily cross the blood-brain-barrier, feeding your brain and resulting in <u>better</u> <u>mental acuity</u>, energy and productivity.



Combined with a well formulated whole-foods diet, IF avoids the blood sugar spikes caused by a high carb diet, which leads to brain fog and low mood issues like <u>depression</u>.

### Intermittent Fasting for Better Physical Fitness

Yup, intermittent fasting also holds benefits for your physical fitness, too. Including...

### Better Metabolism

Intermittent fasting trains your mind and digestive system to get used to eating what you need for the day in a smaller window of time.

This promotes a healthy and proportional intake of food and calories. People who get used to fasting and also eat a ketogenic diet soon learn to only eat when hungry, not according to pre-established mealtimes or impulsive and mindless eating.

Popular belief that fasting negatively affects your metabolism is unfounded.

When done the right way, **fasting actually helps** <u>improve metabolism</u> and promote metabolic flexibility where your body has the machinery to use glucose or fats effectively for energy.

#### **Better Wind and Endurance**

Football players and other athletes build and maintain their "wind" by running and doing other cardio training exercises.

Known in fitness as VO2 max, this is the maximum amount of oxygen per minute, per kilogram of body weight that you use during intense exercise.

The more oxygen you can use at a time, the more work output you can perform. Your VO2 max level is a measure of fitness; elite endurance athletes have twice the VO2 capacity of untrained people.

In one study<sup>[\*]</sup>, scientists tested the VO2 max levels of a fasted group (no breakfast) and a fed group (one hour after a cereal breakfast).

Both groups had starting VO2 levels of around 3.5 liters per minute (L/min), which is close to standards for regular, untrained individuals. The study participants underwent endurance cycle ergometer training and had the following change in VO2 max:





The fasted group increased their VO2max *significantly* more than those who were fed breakfast.

### **Intermittent Fasting and Bodybuilding**

Many people find they feel better and train better on IF.

One of the best and often-mentioned benefits is less hunger. Even though you delay eating, you eat one or two bigger meals compared to eating 2000-2500 calories spread out in 5 to 6 meals during the day. Body builders find they're more satisfied with those bigger meals.

But you *do* need to take care of your protein intake if you're a keen bodybuilder.

#### Muscle protein synthesis and max muscle growth

Consuming more protein at one time of day won't make up for low protein intake at other times of the day when you need it[\*]. There's a maximum anabolic cap at 20g[\*]. You don't "make up for it" by eating 40g of protein in one meal. It doesn't work like that.

Modify your fast to include an evenly distributed protein intake throughout the day during your training days and implement supplements when needed, such as <u>Perfect Keto Perform</u> or <u>Perfect Keto Collagen</u>.

#### BCAAs



Sipping on BCAAs (branched chain amino acids) protects you from muscle damage[\*], speeds up recovery, decreases protein breakdown and helps prevent feeling depleted when you're **training in a fasted state**[\*].

Why the emphasis?

Taking BCAAs means taking proteins, and that means you're not fasting. But it's different during training because BCAAs act as a powerful energy source for your muscles instead. The benefit outweighs breaking your fast.

#### Creatine

Taking creatine supplements (3-5 grams per day) increases lean body mass and muscle fiber size, power output and strength. Taking creatine after your training is found to be better for strength and muscle gains than eating anything pre-workout[\*].

#### **Beta-alanine**

Beta-alanine increases endurance by increasing carnosine levels in the body, which work as a buffer between your cells and the hydrogen ions associated with fatigue[\*].

**Note: Your fasting method should coincide with the physical demands of your training.** The many types of IF are designed to help individuals, bodybuilders and athletes in maintaining health and boosting performance when they need it.

### **Recommended Reading for Benefits of Fasting**

- Intermittent Fasting and Keto
- The Benefits of Fasting on Keto
- Fasting For Weight Loss
- How to Use Ketosis for Hunger Suppression
- Ketosis for Longevity
- <u>Ketosis for Metabolism Control</u>
- <u>Ketosis for Mental Performance</u>
- <u>Ketosis for Seniors</u>
- <u>Ketosis for Cancer Treatment</u>
- Ketosis for Migraines
- <u>Ketosis for Wound Healing</u>
- Ketosis for Alzheimer's Disease
- Ketosis for Epilepsy
- <u>The Biggest Ketogenic Diet Benefits</u>
- <u>10 Reasons Why I'm Fasting Regularly</u>
- Perfect Keto Perform Pre-workout



### **The Types of Intermittent Fasting**

There are seven types of intermittent fasting you can follow. Experiment with a few types to find out which works for you.

Here are the most popular four types:

### #1: 16/8 (16 Hours Off, 8 Hours On) Fasting

Also known as the daily window fasting, or simply skipping a meal!

This is the easiest and most commonly followed method of IF, where you eat for a period of eight hours and fast for 16 hours. You either eat later in the day, skipping breakfast, or eat an early dinner and not eat again until breakfast the next day.

IF veterans may reduce the eating window to less than 8 hours. When you read about 23/1 or 20/4 splits, that means they only eat within 1 or 4 hours during the day.

Fasting for 20 hours or more is also known as The Warrior Diet.

### #2: Alternate Day (24hr Fasting) and 5/2

Alternate day fasting, also known as Eat-Stop-Eat and the UpDayDownDay diet, involve fasting on alternate days of the week and eating unrestricted the other days.

For example, Mon-Wed-Fri-Sun are eating days and Tue-Thurs-Sat are fasting days. This means your last meal for Friday would be dinner, and you won't eat again until Saturday dinner or Sunday breakfast.

For 5/2 fasting, you choose 2 days of the week where you reduce your caloric intake to a quarter of your usual daily intake. Someone who typically eats 2000 calories would instead consume 500 calories for two days per week.

Many find it easier to simply fast, doing the alternate day fasting, so to speak, than restricting their calories.

### #3: Water Fasting

<u>Water fasting</u> is the most difficult type of fasting, and shouldn't be done without supervision or support from an expert.

Some consider water fasting as the only true fast.



For a period of a few days, you eat and drink nothing but water. Zero calories. This means you'd be missing out on crucial vitamins and minerals. We don't recommend strict water fasting for this reason.

#### The usual goal of a water fast is detoxing and fat reduction.

For someone coming from an entirely non-fat-adapted state, ketosis happens at the second or third day mark of a water fast, when your body turns to stored fats for energy.

Overweight people with a lot of excess body fat may feel energized during a water fast, while leaner people may feel lethargic because their bodies are trying to conserve energy at all costs.

**Be warned**: Because of the complete lack of food, water fasting can be extremely uncomfortable, aside from the risks of electrolyte imbalances. If you choose this type of IF, start slow with manageable fasting patterns like 16/8 or alternate day fasting, before going full-tilt with a water fast.

#### Alternatives: Juice fasting and broth fasting

Broth fasting includes sipping on <u>bone broth</u> potentially mixed with fats which would provide small amounts of protein, nutrients and electrolytes.

Juice fasting may have the vitamins and minerals absent in water fasting. People juice vegetables for a reason: if you use fruit juice by itself or as a flavor enhancer for your green juice, the natural sugars in the fruit make it basically the same as sugar water, highly unfit if you want to achieve ketosis.

### #4: Fat Fasting (Fast Mimicking)



True to its name, <u>fast mimicking</u> mimics a fast-- particularly the effects of a water fast-- but you eat healthy fats during the fast, hence the name *fat fasting*.

Your body doesn't distinguish dietary fat from metabolizing dietary fat, and therefore remains in the fasted state. This gives you the benefits of fasting while allowing you the macro and micronutrients your body needs to get into ketosis and all the benefits from brain and body fueled by ketones.

### **Recommended Reading for Types of Fasts**

- <u>Types of Intermittent Fasting</u>
- Fasting on Keto for Beginners
- <u>Water Fasting vs Fat Mimicking</u>
- Good Fats vs Bad Fats on the Ketogenic Diet
- How Much Fat You Should Eat on A Ketogenic Diet

### Which Type of Intermittent Fasting Should You Choose?

This is a common question, but the answer depends on your fat-adapted state and your goals.

As you'll see below, the ketogenic diet helps with fasting because it helps transition your body to be efficient in utilizing stored fats for energy instead of constantly crying out for food (i.e., carbs).

Starting with the 16/8 fasting is easiest for both keto and fasting beginners when you're not yet fat-adapted. You simply skip breakfast or dinner.

Goals come into play when you're already a veteran with fasting or keto.

Perhaps your goal is to get back into ketosis after a particularly bad cheat day (or week). In that case, an alternate-day fast (24hrs) or fat fast may help get you back on track with ketone production.

The most common goal is breaking through a <u>weight loss plateau</u>. Depending on other factors, implementing any of the above fasting methods (except water fasting) works fast in getting you past that plateau.

### **Intermittent Fasting on a Ketogenic Diet**

### Fasting vs Keto: Similarities and Differences

Intermittent fasting and the ketogenic diet have similar benefits because of <u>ketosis</u>, the metabolic state of burning fat instead of glucose. Your body gets really lazy at this natural process when you keep it regularly supplied with carbs. When you fast, you force your body to burn stored fat because there's no readily available glucose from eating carbohydrates.



Fasting triggers several desirable bodily processes:

- ketosis
- lipolysis
- autophagy

You get into ketosis faster through fasting than you would by slowly transitioning to a fat-adapted state.







### Intermittent Fasting and Keto Combined

Fasting helps you get into ketosis, and being in ketosis also helps you fast.

A lot of keto-ers fast regularly because it helps them break through <u>weight plateaus</u> and it's an effortless way to control calories. And a ketogenic diet helps with longer periods of fasting. The benefits and easier transition are mutual.

#### **Easier transition**

- Fasting helps you <u>avoid the keto flu</u> and a fat-adapted or ketogenic state also prevents the fasting flu.
- In a ketogenic, fat-adapted state, your body is already introduced to tapping into your fat stores for energy instead of relying on carbs for glucose.
- The ketogenic diet macro portions (high fat, moderate protein, low carb) also helps you transition to fasting easier.

#### **Muscle protection**

A high fat diet like the ketogenic diet also makes sure your body has a source of fat and uses it during your fast, instead of breaking down muscle protein for energy. For this reason, keto-ers who fast for the day drink black coffee with either heavy, full-fat cream, <u>butter, ghee</u> or <u>MCT oil</u> <u>or powder</u>.



In the next section we'll pivot from the benefits of fasting to the foods that go great with intermittent fasting.

### **Recommended Reading for Ketosis and Fasting**

- Intermittent Fasting and Keto
- The Benefits of Fasting on Keto
- The Ultimate Keto FAQ-- and Answers
- Fasting on Keto for Beginners
- <u>Ketosis Side Effects</u>
- Ketosis vs Intermittent Fasting
- The Biggest Ketogenic Diet Benefits
- The Results of My Four-Day Fast to Start A Ketogenic Diet

### What to Eat When Intermittent Fasting

Eating while fasting sure sounds like an oxymoron, but not so! What you eat during your eating windows matter:

- You need to make sure you get enough calories for the day.
- **Avoid high carb intake** because it only makes fasting unbearable, resulting in blood sugar spikes, brain fog, lethargy and low mood.
- You want **a supply of good fats** so that your body burns fat and not muscle protein, which can ruin your muscle mass.

Aside from the ketogenic diet and healthy <u>drinks fortified with fat sources and ketones</u>, some find that eating nutritious greens and natural, complex carbs like sweet potatoes gives them energy and endurance for exercise, and help them stick to their fast.

### Do I Need Carbs?

Keto-ers know that you don't really need to consume carbs to function.

In the absence of carbs, your brain and body can use an alternate energy source: ketones.

If you're going keto, turn to leafy greens for the most nutritious carbohydrates that are filled with fiber, the type of carbs that won't take you away from the benefits of ketosis.

Avoid sugary and starchy foods.

### **Recommended Reading For Food On Keto and Fasts**

- Full Ketogenic Diet Food List
- Full List of Foods to Avoid on A Ketogenic Diet

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- <u>Ketogenic Diet Meal Plans</u>
- <u>The Ultimate Healthy Keto Snack List</u>
- How to Do the Ketogenic Diet on A Budget
- Can You Eat Healthy, Complex Carbs While In Ketosis?
- Net Carbs: The Difference Between Effective and Non-Impact Carbs
- <u>Keto Macros: How to Calculate Your Optimal Ketogenic Macronutrients</u>
- Finding Hidden Carbs on A Ketogenic Diet
- How to Keep It Simple on the Keto Diet
- Keto Diet Alcohol Rules: What to Drink, What to Avoid
- The Pros and Cons of Nuts on a Ketogenic Diet
- How Fast Will I Lose Weight on Keto? What to Expect When Dieting On Keto
- Good Fats vs Bad Fats on the Ketogenic Diet
- How Much Fat You Should Eat on A Ketogenic Diet
- How Much Protein Can You Eat on A Ketogenic Diet?
- How Too Much Protein is Bad for Ketosis
- Does A Ketogenic Diet Change Your Lipid Profile?
- What are the Best Vegetables to Eat on Keto?

### **Exogenous Ketones for Intermittent Fasting**

### What are Exogenous Ketones?

During a fast, your body has no immediate energy supply so it turns to stored fat and converts it into fuel. This process is ketosis, and the metabolic fuel from fat are called ketones.

Exogenous ketones are ketone supplements.

Your body produces and utilizes ketones while in ketosis. When you take exogenous ketones, you add more ketones for your body to use.

Will exogenous ketones <u>break you out of a fast</u>? No. All they do is give you more fuel and essential minerals for physical and mental energy.

#### Ketones feed your brain.

This mental energy is why so many keto-ers and IF veterans love keto and fasting. Without the fluctuations in blood sugar that cause sleepiness or brain fog -- like what happens after heavy meals of pasta, pizza or potatoes -- you have a steadier mental acuity throughout the day.

Ketones cross the blood-brain-barrier and give your brain a clean energy source. You feel mentally alert and *alive*.



Better cognition means better decisions, like sticking to your fast and eating healthy options during your eating windows!

### How to Use Ketones While Fasting

Exogenous ketones have tons of benefits for fasting and the keto lifestyle in general. How you take ketones depends on what benefits you need in particular.

### Avoiding the Keto Flu or Fasting Flu

The keto flu and fasting flu are similar to each other, an onset of feeling ill brought on by the change in diet.

Any transition to your body can have side effects, but more so when it involves a gearshift to how your body produces and uses energy.

When you fast or switch to a keto diet, ketones greatly reduce or help you <u>avoid these</u> <u>keto/fasting flu symptoms</u>:

- Bloating
- Headaches
- Irritability
- Low energy
- Fatigue

When and how to take exogenous ketones: Over 3-5 days during your transition into ketosis, take smaller doses of  $\frac{1}{3}$  to  $\frac{1}{2}$  of a full scoop of <u>Perfect Keto Base</u> spread out each day.

### **Mental Sharpness**

You don't have to be in ketosis to give your brain a boost. Taking exogenous ketones provides the brain with 4-6 hours of high-octane <u>mental energy</u>.

**When and how to take exogenous ketones:** Take a full scoop on an empty stomach, preferably first thing in the morning. Perfect Keto Base comes in Chocolate Sea Salt, Vanilla, Coffee and Peaches and Cream flavors-- reminiscent of your breakfast drinks and fruits!

### Fat Burning

Ketones also work as a nudge for your body to keep burning your stored fat for energy, like priming a water pump with water. You prime yourself with ketones to produce and *use* ketones.

When and how to take exogenous ketones: Take one scoop of Perfect Keto Base anytime in between meals for constant fat burning.



### Getting Into (Or Back Into) Ketosis

Speaking of priming the pump, the same applies if your goal with fasting is to get into ketosis, or get back into it after a cheat day-- or a cheat period.

Exogenous ketones tell your body you want to switch to ketones as your primary energy source (again).

When and how to take exogenous ketones: Take a ½ to full scoop of Perfect Keto Base whenever you want to get into ketosis quickly and/or right after a meal heavier on carbohydrates than usual.

### **Energy for Exercise**

Note that you should consider reducing high-intensity workouts during your fast. But athletes, fitness buffs, moms and dads need their energy.

Ketones help with that, giving you instant energy from your brain to every muscle in your body.

When and how to take exogenous ketones: Before a workout that will be 45 minutes or longer, take a full scoop. Then take another ½ of a scoop for every hour greater than two hours of continuous work you do. You can take either Perfect Keto Base or <u>Perfect Keto Perform</u> <u>Pre-workout</u>.

#### In summary, here are the best times to take exogenous ketones:

- For fasting, when you need to suppress hunger, on an empty stomach
- When you wake up in the morning
- Before workouts, exercise, anything physically or mentally taxing
- After a carb-heavy meal when you're trying to get back into ketosis
- Every day to enhance ketone levels

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**Recommended Reading on Supplements for Ketosis** 

- What Are Ketones?
- Perfect Keto Users Guide
- How to Maintain Ketosis
- <u>When and How to Supplement With Ketones</u>
- <u>Why Supplement With Exogenous Ketones</u>
- The Different Types of Ketone Supplements
- Will Ketones Kick You Out of A Fast?
- How to Use (and Not to Use) Exogenous Ketones For Weight Loss
- When and How to Use Perfect Keto Base
- When and How to Use Perform Pre-workout
- <u>Why Exogenous Ketones Are Expensive and How They Save You Money</u>
- Why Exogenous Ketones Taste Bad
- Why Ketones and Ketosis Can Cause Stomach Pain
- Perfect Keto Base: Exogenous Ketones BHB Salts
- Perfect Keto MCT Oil Powder
- Perfect Keto Perform Pre-Workout



### The Truth About Intermittent Fasting "For Women"

You may have read of the "gentle" fasting for women called crescendo fasting and articles and blog posts concluding that IF benefits favor men and not women[\*].

Hormonal and genetic differences do play a role in your diet. Let's address some commonly cited myths, studies and assumptions about women and intermittent fasting.

### Female Hormones and Intermittent Fasting

Women's hormones are more sensitive to changes in your environment and diet so that it may respond accordingly, like triggering your hunger hormones leptin and ghrelin when it senses you're underfed.

From an evolutionary perspective, a woman's body *always* keeps you in prime baby-making condition, or would reduce fertility during times of stress and starvation: not safe or ideal time for a baby! So what triggers hormonal responses?

- Too little food and poor food choices
- Too much exercise
- Too much stress, either from too much exercise or from mental stress
- Too little sleep: Not enough rest/recovery
- Infection and inflammation (illness)

None of the above should occur with IF done right.

### Debunking Intermittent Fasting Studies for Women

A study on rats<sup>\*</sup> is the often-cited scientific proof that women shouldn't fast, or should fast differently.

In it, the rats only ate every other day for 12 weeks. Two weeks into the study, the female rats' hormones were already out of whack, their periods stopped and their ovaries shrunk. Horrible, yes.

But we'd like to point out two things:

- 1. **Rats live only a few years**. One full day's fasting for a rat is the equivalent of depriving a human being of food for several days. That's starvation mode, it *would* throw your bodily functions off-kilter, and is definitely not recommended for women *or* men.
- 2. Calorie restriction during intermittent fasting is not as drastic as what the rats were put through.



### This recent randomized clinical study on human adults<sup>\*</sup> found **no significant differences between the effects of alternate-day fasting on men and women:**

"There were no significant differences between the intervention groups (vs the non-diet intervention group) in blood pressure, heart rate, triglycerides, fasting glucose, fasting insulin, insulin resistance, C-reactive protein, or homocysteine concentrations..."

The result of this study highlights instead that alternate-day fasting has no superior effect compared to daily caloric restriction. According to this study, alternate day fasting won't make you lose weight faster than the daily 16/8 method.

### So Should Women Do The Crescendo Method of Intermittent Fasting?

The crescendo method is a lot like 16/8, alternate-day, and the 5/2 fasting methods mentioned above in this guide: You fast for 12-16 hours *on non-consecutive days*.

The theory behind it is that it wouldn't "shock" your hormones or ramp up your appetite. Another variation is 16/8 turned into 14/10 for women.

Instead of letting doubt or scientific evidence discourage or confuse you, the best advice is to listen to your body. Everyone is different, man or woman.

What worked for your friend may not work for you, even with the same weight, height, race and gender.

When you try intermittent fasting, pick a method that works for your body and your lifestyle. If you're a breakfast person, your 16/8 method can skip dinner instead of breakfast. If you find 14/10 works better for you, go for it.

And as mentioned above, make sure to eat enough calories!

Consult your doctor before trying intermittent fasting or the ketogenic diet (or both). Fasting is not recommended for pregnant or nursing women, those who want to conceive and adolescent/pre-adolescent girls.



### Recommended Reading

- Ketosis During Pregnancy
- Does A Ketogenic Diet Affect Women's Hormones?
- Hormones and the Ketogenic Diet
- Keto For Women
- Here's What Research Says About Keto While Breastfeeding

### **How Intermittent Fasting Affects Testosterone**

Bodybuilder guys follow IF for its effects on testosterone (T) levels, which is essential in body repair and growth.

Even women have testosterone. For men, testosterone supports and increases muscle mass and strength (bigger and stronger) through improved protein synthesis. It blocks fat uptake and storage and burns fat instead by increasing fat-burning beta-adrenergic receptors in your cells.

You know testosterone's role in blood flow. Erections aside, blood flow is good for heart health and red blood cell production, which extends T's benefits to healthy kidney function and bone growth and density.

Testosterone also has positive effects on cognition and mental health.

So how does intermittent fasting tie in with T levels? Here are the facts:

- A 24-hr fast elevates GH (growth hormone) levels by up to 2000%[\*]. GH and T are intertwined, supporting each other and supporting guys in muscle building, penile function and better cognition[\*][\*][\*].
- Fasting also increases LH (luteinizing hormone) levels by 67%. LH is the T-precursor.
- In the same study, T levels increased by 180%-- instant visibility of effects [\*].
- Fasting regulates leptin levels<sup>[\*]</sup>, which in turn stimulates testosterone secretion from the hypothalamus<sup>[\*]</sup>.

#### Important note:

Fasting burns body fat, and the less body fat you have, the more testosterone you have and can produce.

Because of this, the above effects on GH, LH and T levels were observed in non-obese men[\*]. The same way you can't expect to see sculpted muscle before you lose fat, it's unrealistic to count increased T-levels before you lose any extra fat in your body first.

Good news: Fasting is an effective tool for both.



### **Testing Results During and After a Fast**

<u>Testing ketone</u>s, glucose levels and other measurements give you satisfaction in your fasting. It's fun and motivating! And they show you that everything's working as they should.

But don't set your heart on measurements. Every person responds differently according to insulin levels(sensitivity or resistance), genetics and other factors unique to you. How your friend responded to *her* fast may not be the same for you.

### How to Test Ketone Levels

Ketones going up during your fasting--without the aid of exogenous ketones-- means your body has entered ketosis, burning your stored fats and turning them into ketones for fuel.



### **Urine testing**

What to use: Urine strips. What it measures: <u>Acetoacetate</u>, one of the ketone bodies.



**How it works:** When you begin fasting or eating a ketogenic diet, your body produces ketones and they won't all be used up. Some spill into your urine instead of getting stored again as fat.

Pee on a stick, tap excess urine, and wait, referring to the package for the information on the detectable ketone levels measured.

**Pros:** It's the easiest and cheapest test to do. <u>Strips are affordable</u>, and it's heartening to see the shift when you're just starting out with the ketogenic diet.

**Cons:** Messy. Can be a very misleading test. Acetoacetate levels in urine would vary according to hydration and electrolyte levels. Acetoacetate also only shows up in your urine if they are in excessive levels.

As your body becomes keto-adapted, it will use acetoacetate, and levels would be very low in your urine even if you are actually in ketosis, so urine strips won't be an accurate test in the long-term.

#### **Breath testing**

#### What to use: Ketonix meter

What it measures: <u>Acetate/acetone</u>, a ketone body produced from the metabolism of beta-hydroxybutyrate (BHB) to acetoacetate and into acetate. Acetate/acetone levels are therefore related to your BHB levels. More acetate means more BHB. BHB is the primary ketone body.

**How it works:** Power up the Ketonix meter by USB or battery. When it warms up, blow into it until it begins flashing. Take note of the number and color. Red for most acetone, green for least acetone. More flashing means more acetone per color.

**Pros:** Unlike pee strips and blood strips, a Ketonix meter is reusable. Also convenient without the mess of urine or blood.

Cons: Takes longer to get a reading. Indirect and inaccurate measurement.

Blood testing What to use: Blood meter What it measures: Beta-hydroxybutyrate(BHB)

**How it works:** <u>BHB</u> is the primary ketone body that shuttles energy throughout your body during ketosis. It floats in your blood on its way to your cells, therefore blood testing is the most accurate way to measure your ketones.



The home blood meter test is the same one used by those with diabetes to measure their blood glucose. Prick your finger and dab the drop of blood to the strip then plug the strip into the blood meter to tell you your BHB levels.

Pros: Highly accurate and consistent.

**Cons:** Finger pricking is not for everyone, and the meter and the strips can be expensive.

### How to Test Glucose Levels

As you fast, blood sugar levels should go down as you deplete your body's glycogen (stored glucose). In ketosis, glucose levels go down too when you use them up through exercise without replenishing them with a high-enough carb intake.

What to use: Blood meter What it measures: Blood glucose

**How it works:** If your blood sugar goes up, this *may* mean your carb intake was higher during your eating windows. You can adjust accordingly. But note that there are other reasons for blood sugar spikes.

The pros and cons of testing blood glucose are the same as for blood testing for ketones above, except for the drawback of blood glucose levels being erratic sometimes, especially for hypoglycemics (fasting is not recommended for the hypoglycemic) and women during hormonal peaks and dips.

**Another pro:** Testing your blood sugar levels is one of the most useful metrics as you discover how your fasting glucose levels respond to keto-- also known as the <u>glucose-ketone index</u>, which we get into below.

### How to Calculate Your Glucose-Ketone Index (GKI)

One of the benefits of intermittent fasting, and the top reason fasting and a ketogenic diet are prescribed by doctors, is for lowering blood glucose.

Low blood glucose gets you into ketosis, which in turn helps manage diabetes and <u>epilepsy</u>. It also works as a <u>cancer treatment</u>. Low glucose means no food for cancer cells. Starving cancer cells become dead cancer cells[\*][\*].

Conversely, you could have high ketone levels and be deep in nutritional ketosis, but if you also have high blood glucose, it would negatively affect your health and prevent you from gaining the benefits of ketosis.



### What is The GKI?

The <u>GKI</u> combines your ketone and glucose levels into one number, to give you a better, more accurate picture of your metabolic health.

The GKI is used to track changes and progress for certain goals and benefits gained from ketosis like weight loss, athletic performance, and management of metabolic diseases like type 2 diabetes, and even cancer treatment.

For fasting, the GKI is a handy tool to see how your body responds to fasting, especially when you do it the first time, and when you start to fast regularly.

### What Affects the GKI?

Aside from medical conditions (like diabetes and glandular illnesses) that affect your insulin and glucose balance, your glucose is affected by:

- **Carb intake**: Your GKI is the reason you also have to watch what you eat during your eating windows. Eat a low carb diet to keep glucose down.
- **Stress**: Another factor that affects blood glucose and often taken for granted is stress. Take it easy during your fast-- don't make unnecessary demands on your body when you're not feeding it (much). Learn how to reduce mental stress to avoid cortisol and epinephrine (stress hormones) from spiking your blood sugar for fight/flight.

WHAT IS THE GLUCOSE KETONE INDEX (GKI)			
1	V	IT'S USED AS A BIOMARKER FOR TRACKING METABOLIC HEALTH.	
2		IT'S MEASURED BY DIVIDING YOUR BLOOD GLUCOSE LEVELS BY YOUR BLOOD KETONE LEVELS TO GET ONE NUMBER.	
3	hinita i	IT'S A WAY OF SIMPLY MEASURING THE RELATIONSHIP BETWEEN YOUR GLUCOSE LEVELS AND KETONE LEVELS AT ANY TIME.	
		PERFECT <b>KET</b> Ö	

### How to Measure Your GKI:

A way to achieve the benefits of fasting is to bring your GKI as close to 1 as possible.

The formula for calculating the GKI is: GKI = (Blood Glucose (mg/dL) / 18 ) / Blood Ketones (mmol/L)

- You'll need a blood meter. See above on how to measure ketones and glucose.
- When you have your measurements, divide your glucose number by 18. This converts the blood glucose reading from mg/dL to mmol/L. If the reading for your glucose number is already in mmol/L, skip this step.
- Divide your glucose number (already in mmol/L or converted to mmol/L) by your ketone level number.
- The number you get is your GKI.

### **GKI Numbers by Goal or Treatment:**

Here are the widely-accepted GKI measurements according to goals and conditions/treatment:

- **GKI above 9:** not in ketosis
- GKI 6-9, low level of ketosis: Beneficial for weight loss and optimal health and weight
- **GKI 3-6, moderate ketosis:** The desired level of ketosis for addressing insulin resistance, type 2 diabetes and obesity management
- **GKI of less than 3, high level of ketosis:** Typically used to address epilepsy and cancer treatment. It is desirable to enter this level of ketosis periodically every year for disease prevention.

## Other Important Measurements While Fasting: Weight, Body Fat, Body Tape Measurement

### Weight

When you fast, you will lose water weight. This is because your body uses water to hold glycogen in your muscles and liver. When your glycogen stores deplete, there is less need for water to hold it.

That's why many people see large weight loss when they fast. After your fast, however, you'll gain that water weight back.

In fasting and in keto, you burn fat and may replace that with lean muscle. Muscle is heavier than fat. Unless you have a lot of fat to lose, take the scale numbers with a pinch of salt, and grab the tape measure instead.

### Body tape measurement

After you lose all the water weight, you'll start seeing "modest" weight loss when you fast or go keto and you replace fat with muscle.



But body tape measurements are gratifying. They show you how far you've come from your previous waistline.

When doing body tape measurements, consistency is key. Use the same tape measure, and lay it flat on the same spot as always. For your thighs, calves, biceps and arms, measure the dominant side (i.e., the right arm if you're right-handed).



### Body fat percentage/photos

Skinfold calipers work great. Or you can take photos of yourself and use a visual estimate to measure your body fat percentage.

Intermittent fasting and the ketogenic diet combined burns through fat, and you can definitely see the results in photos. Keep taking photos!

### **Recommended Reading for Testing Results**

- How to Track Ketogenic Diet Results
- Top 7 Basic Metrics to Track on A Ketogenic Diet
- <u>A Guide to Testing Ketone Levels</u>
- Testing Ketone Levels After Taking Exogenous Ketones
- What is Glucose-Ketone Index and Why You Should Care
- The Glucose-Ketone Index and Why It Matters
- How to Easily Track Your GKI on Your Ketogenic Diet
- <u>What is AcetoAcetate?</u>
- <u>What is Beta-HydroxyButyrate (BHB)?</u>
- What is Acetone?
- Perfect Keto Ketone Testing Strips

### **The Safety of Intermittent Fasting**

Talk to your doctor before starting any type of fast.

Intermittent fasting may not be advisable for you for any number of reasons, like if you are hypoglycemic, or don't have enough fat stores your body can burn.

### Is Intermittent Fasting Safe?

Fasting is natural -- humans and most other species have been doing it forever.

The benefits of fasting greatly outweigh the downsides and potential dangers. These dangers happen when you undertake fasting without ample knowledge about how everything works together to be beneficial rather than harmful.

To stay healthy and maintain physical and mental performance when you fast:

- First, consult your doctor, especially if you have conditions for which fasting is not advisable.
- <u>Take supplements</u> or a <u>greens powder</u> to compensate for vitamins and minerals you may be missing.
- Calculate your ideal caloric intake and eat that amount during your eating windows.



- Stay hydrated.
- Take exogenous ketones.

These steps help you avoid the dangers of fasting done wrong.

### The Dangers of Fasting

**Electrolyte imbalances:** Your body needs electrolytes for normal organ function: sodium, calcium, potassium, magnesium and phosphate. These essential electrolytes are present in supplements and exogenous ketones, and of course, in food. Make sure you replenish these even during your fast.

Any imbalance and you'd start to see negative effects like insomnia, irritability and fatigue.

**Yo-yo dieting results:** Fasting may not be ideal if you're prone to binge-eating. Fasting aids weight loss, but unless you accompany it with a good, balanced food intake on your eating windows, you could gain all the weight back, or even add to it.

**Overtraining:** Seeing the results of fasting can motivate some people so much that they also decide to <u>exercise</u>, aiming to compound their results that way. This can result in electrolyte imbalances and stress, both of which lead to serious issues like blood sugar spikes and even collapse.

**Ketoacidosis:** As we mentioned above, we don't recommend water fasting because you don't get calories, vitamins and minerals your body needs to function everyday: this is starvation. People who starve their bodies are at risk for ketoacidosis, where the ketone levels in the blood are extremely high, making the blood acidic. But fasting per se doesn't cause ketoacidosis.

A lot of other factors combined may lead to it, which is why you should consult your doctor before doing a fast.

### Ketosis vs. Ketoacidosis

Ketosis is natural, while ketoacidosis is not. It's also called diabetic ketoacidosis because it's commonly found among diabetics. It can be a sign of poorly managed insulin and diet, commonly seen in those with Type 1 diabetes, and less common in those with Type 2.

It also occurs among alcoholics and people who are absolutely starving.



# KETOSIS **VS** KETOACIDOSIS

### THEY ARE NOT THE SAME!

KETOSIS	KETOACIDOSIS
Low level of ketones in the blood	Extremely high level of ketones in blood
Normal process of the body	Can turn the blood acidic, deadly if untreated
Safe function of a low-carb, ketogenic diet	Occurs in diabetics who don't take enough insulin or aren't well, people who are starving, or alcoholics
PERFECT KETO	PERFECTKETO

### The symptoms of ketoacidosis:

- Excessive urination
- Dehydration
- Extreme thirst
- Hyperglycemia
- Vomiting
- Nausea or stomach pain
- Shortness of breath or gasping
- Fruit-smelling breath (too much acetone in your breath)
- Feeling overly tired
- Feeling confused

#### What causes ketoacidosis?

- Starvation combined with alcoholism
- An overactive thyroid
- Alcoholism
- Cardiovascular disease
- Acute major diseases like pancreatitis, sepsis or myocardial infarction



- Illness or infections like urinary tract infections and pneumonia
- Medications that may inhibit proper use of insulin
- Drug abuse
- Stress

Consult your doctor if you're at risk for ketoacidosis. Ketosis has all the benefits but ketoacidosis has extreme symptoms that should always prompt you to consult your doctor.

Aside from the above, the only other issue of skepticism for fasting is eating disorders.

### Fasting and Eating Disorders

If in the past or present, you struggle with disordered eating, intermittent fasting is not advisable for you. Fasting may make your condition worse, or trigger it to return.

To gain all the benefits, fasting needs to be part of a healthy, balanced, and grounded diet.

### **Recommended Reading on Safety**

- Is It Dangerous to Fast?
- <u>Ketosis vs. Ketoacidosis</u>
- How to Exercise When You're in Ketosis

### **Get Started with Intermittent Fasting**

Intermittent fasting is a method with various formulas you can try to take advantage of the many proven benefits: weight loss, disease prevention/treatment, ketosis, better mental and physical performance and overall health and fitness.

How much and how fast results manifest may vary, and what you do eat during your eating windows should be optimal for your own unique body composition and daily caloric needs.

**Be mindful and get a read of your tendencies toward food and what your body likes.** If you fast for 24 hours to justify an unhealthy binge before or after-- that's a picture you don't want to be in.

<u>Learn about your macros</u> and track your progress to detect any issues like glucose spikes that may be preventing you from enjoying the benefits of fasting and the ketogenic diet. A great place to start is the <u>Perfect Keto Macro Calculator</u>.