THE SECRETS ONLY A BIOCHEMIST, DIETITIAN AND CERTIFIED SPORTS NUTRITIONIST COULD KNOW

SHAWN WELLS, MPH, RD, LDN, FISSN

FASTING FOR ENERGY

A Guide to Discovering **YOUR** Fasting Type and Living an Energized Life

TABLE OF CONTENTS

4 FASTING OPTIONS TO GET STARTED **3**

What's Your Fasting Type Quiz *5*

SCIENTIFIC SUMMARY OF THE CELL **10**

Understanding the Fasts *13*

ADVANCED SECTION **24**

POTENTIAL BENEFITS OF INTERMITTENT FASTING **29**

INTERMITTENT FASTING FOR WOMEN CAN WORK **35**

SUPPLEMENTS WHILE FASTING **46**

INTERMITTENT VS. EXTENDED FASTING **52**

THE MISSING LINK IN SUMMARY **56**

REFERENCES **60**

4 FASTING OPTIONS TO GET STARTED

Pick the One That Best Suits Your Goals and Lifestyle

It's likely you have heard of intermittent fasting, though you might not fully understand it. With all the information out there, and with up to 15 different types of fasts, it quickly gets complicated. There is Time Restricted Feeding, Alternate-Day Fasting and Alternate-Day Modified Fasting, Fasting Mimicking Diets, Continuous Energy Restriction, and Calorie Restriction just to name a few. If you're feeling overwhelmed, I don't blame you. But I am happy to tell you it doesn't have to be so complicated. In this guide, I'm going to walk you through the ins and outs of fasting and the various ways it can be done, simply.

The first piece of information I want to share is that it helps to remember the difference between starvation and fasting. They are very different. Fasting is deliberate and voluntary; starvation is forced upon and happens without control. Your body is starving when it is deprived of nutrients, but when you are fasting, your body creates those nutrients from endogenous fuel supplies in a controlled and efficient way. The body prevents starvation by entering a state of nutritional ketosis – a state where you use fat for energy and you actually feel amazing!

Over the last decade or so, intermittent fasting (IF) has garnered a ton of traction and popularity for its health benefits, including weight loss. It has been around for much longer though. In fact, periods of voluntary fasting – which is a key distinction from starvation – have been practiced since the earliest antiquity by people around the globe. The problem is that modern life has complicated IF because of busy schedules, an avalanche of information, and different health needs. So, how can we simplify it safely

I've broken down the many different types of intermittent fasts into four basic fasting types:

1. **Beginner-Friendly Fasting**
2. **Female-Friendly Fasting**
3. **Pure Fasting**
4. **Flexible Fasting**

There are similarities between some of these types, but there are significant differences that can make each better suited for different individuals. So, let's get to know the type of person best suited to each so you can decide which fasting type you fall into.

Getting Started Jenny/Jimmy

Meet Jenny and Jimmy. They have never tried any fasting before but are intrigued by what they have read. They have consistent daily schedules meaning their wake, sleep, and work hours are typically the same. They do best with eating and diet plans that are simple and do not have a lot of complexity in terms of how to approach fasting. They just want to get started in the easiest way possible and then, maybe, hone things in along the way.

Fasting Farrah

Meet Farrah. Farrah is a woman of menstruating age whose goal is to have more energy, but she is already "lean" at less than 16% body fat. She exercises occasionally and has an interest in trying IF but has heard it can cause some issues for women. Her overall energy level is balanced but she does find that if she goes too long without eating, she can become "hangry." Farrah desires consistency in her menstrual cycle.

Flexible Frannie/Frank

Meet Frannie and Frank. These two individuals enjoy flexibility in their schedule. They exercise a few days a week with rest days worked into their schedule. They have tried IF before and are looking to take it to the next level.

Detox Danielle/Daniel

Meet Danielle and Daniel. These two have dabbled in IF before but are ready for the benefits of longer fasts. They are interested in gaining the most from IF such as anti-aging benefits, inflammation reduction, and detoxing. They both have consistent training and rest days each week and eat a healthy balanced diet most of the time.

Does one of these individuals sound like you? If you're still unsure, take this simple quiz to find out.

What's Your Fasting Type Quiz

1. Are you a female who is extremely lean? (under 12% body fat)
   - ❑ Yes
   - ❑ No

2. Are you pre-menopausal?
   - ❑ Yes
   - ❑ No

3. Do you have experience with Intermittent Fasting?
   - A) No, a complete newbie
   - B) A little knowledge
   - C) Yes, but I want to take it a little further
   - D) Yes, I've have explored IF a lot

4. Do you have experience with Extended Fasting?
   A) No, that sounds too difficult
   B) No, I need to eat more frequently than that
   C) No
   D) Yes
5. Do you snack often
   A) Sometimes
   B) Yes, my energy dips if I don't eat frequently
   C) Not really. I eat when I can find the time
   D) No

6. Have you done Keto before or are you currently Keto Adapted?
   A) No, too difficult.
   B) No, I prefer a wider variety of foods.
   C) I usually eat whatever I can grab based on my schedule.
   D) Yes, I have done Keto.

7. Do you drink Bulletproof coffee in the morning or can you make do without eating breakfast?
   A) What's Bulletproof coffee?
   B) I do best when I can eat in the morning
   C) I drink Bulletproof coffee or I sometimes don't eat breakfast. It depends on my schedule.
   D) Yes, I frequently drink Bulletproof coffee.

8. Is flexibility important for your schedule?
   A) Not really
   B) No, I can move things around as long as I know when the next time, I will be eating is so I don't tire too quickly.
   C) Yes, my schedule is never the same.
   D) My schedule is pretty set from week to week.

9. Are you someone who can go long periods without feeling an overwhelming need to eat at a set time?
   A) I don't know. I've never really tried.
   B) No, I get "hangry" if I go too long.
   C) Yes, I just work food into my schedule when there is the time.
   D) Yes, I frequently fast so that is normal for me.

10. How often do you work out or train?
   A) Sometimes
   B) A few days a week
   C) I exercise when I have the time.
   D) I usually train about 5 days a week.

TOTALS

A		C	
B		D	

QUIZ Results

Getting Started Jenny/Jimmy
If you answered mostly A

Fasting Farrah
If you answered mostly B and/or answered YES to questions 1 and 2

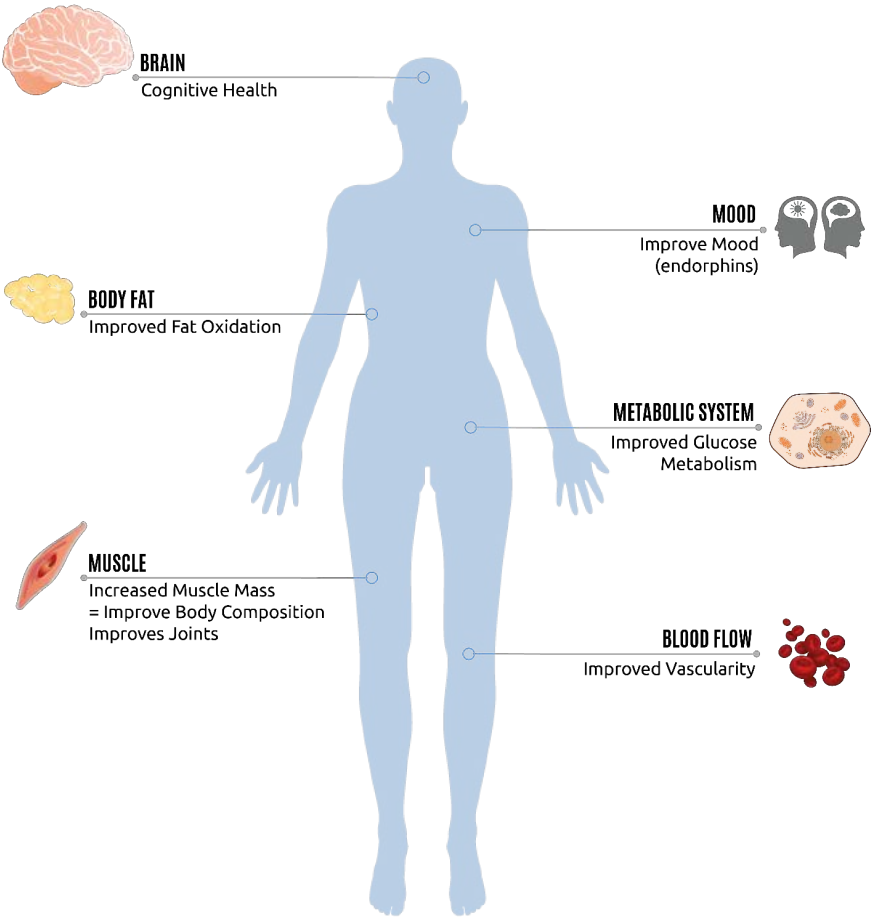
Flexible Frannie/Frank
If you answered mostly C

Detox Danielle/Daniel
If you answered mostly D

Now that you know your fasting archetype, we can dive into the specifics of the fasts. This next section will go into details about what each fast entail and how you can implement it. Once you have tried intermittent fasting for a while and are ready to explore more, I encourage you to read the next section of this guide, The Advanced Fasting Guide. This will explore some of the additional fasts and go more in depth with the benefits of fasting.

It is my hope that you begin to see the benefits of fasting through this guide and feel comfortable trying it out for yourself!

WEIGHT LOSS IS OFTEN THE ULTIMATE GOAL, BUT YOU ALSO ACHIEVE:



Graphic 1

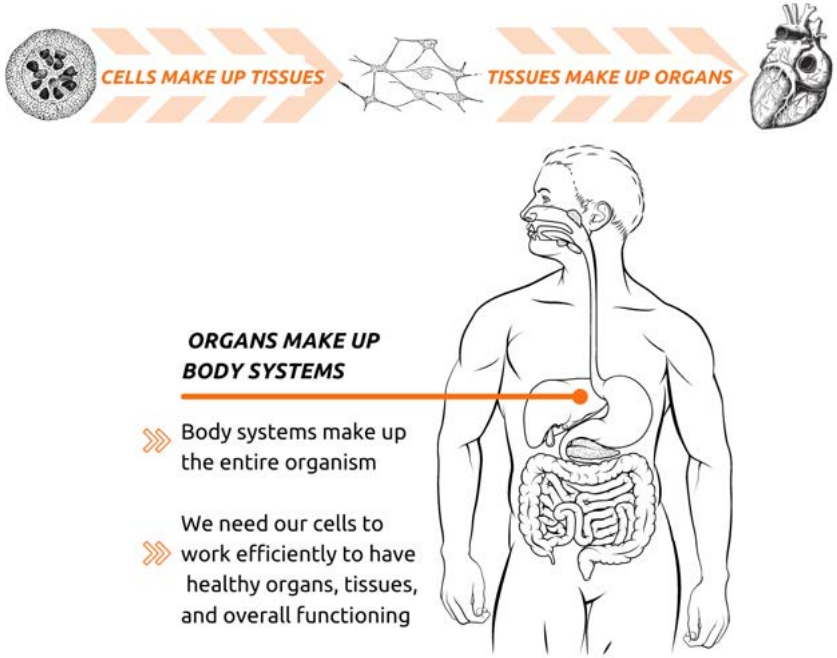
SCIENTIFIC SUMMARY OF THE CELL

The **Cell** is the basic unit of what our bodies are made of and different cells make up all the parts of the body.

- Cells make up tissues.
- Tissues make up organs.
- Organs make up body systems.
- Body systems make up the entire organism.
- We need our cells to work efficiently to have healthy organs, tissues, and overall functioning.

The Cell

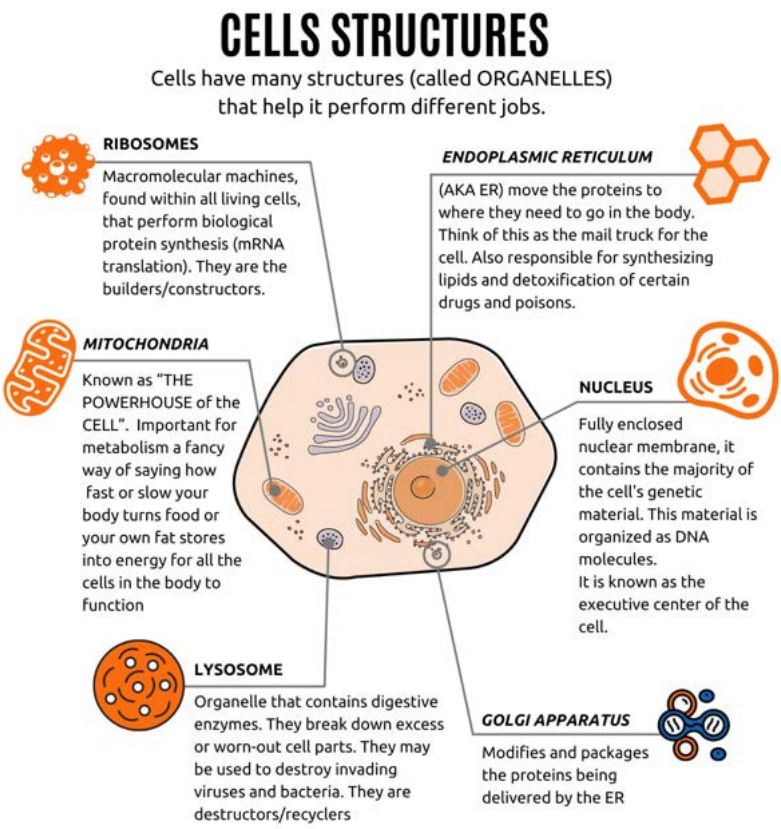
The basic unit of what our bodies are made of, different cells make up all the parts of the body.



Graphic 2

Cells have many structures (called **Organelles**) that help it perform different jobs:

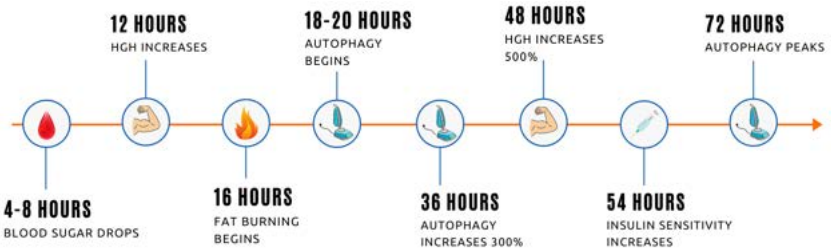
- **Mitochondria** is known as "THE POWERHOUSE of the CELL" and plays an important role in metabolism, a fancy way of saying how fast or slow your body turns food or your own fat stores into energy for all the cells in the body to function.
- **Nucleus** stores the DNA (the "brains" of the cell) and is where the DNA becomes a new cell.
- **Ribosomes** are where proteins are made, the "construction" process is initiated.
- **Endoplasmic Reticulum** (ER) move the proteins to where they need to go in the body. Think of this as the mail truck for the cell. Also responsible for synthesizing lipids and detoxification of certain drugs and poisons.
- **Golgi Apparatus** modifies and packages the proteins being delivered by the ER.
- **Lysosomes** are the big cleaners of cell debris.



Graphic 3

Intermittent Fasting promotes **CELLULAR AUTOPHAGY**

- Broken down, autophagy literally translates to "self-eating" and is also used to describe the process the cell goes through when its organelle's clean up the "junk"
- Using up stored sugar and breaking down fat cells for energy
- Cleaning up of inflammation leading to less DNA damage
- Throwing away and breaking down proteins that were not made correctly by the lysosomes



Graphic 4 - Extended Fasting Timeline

*HGH (Human Growth Hormone): produced by the pituitary gland, spurs growth in children and adolescents. It also helps to regulate body composition, body fluids, muscle and bone growth, sugar and fat metabolism, and possibly heart function.[1]

Understanding the Fasts

One of the things that people like the most about IF is that it isn't a diet that tells you what foods you can or can't eat but rather tells you when you should eat. This can feel far more doable than being told you are no longer allowed to eat your favorite food.

To get started, you need to understand what the 4 different types of fasts are in this guide and then match them to whatever fasting type you are.

1) Beginner-Friendly Fasting

The first fast I'm going to break down for you is the Beginner-Friendly Fasting best suited for "Getting Started Jenny/Jimmy". This is also known as 16:8 fasting or Time-Restricted Eating (TRE). This means you will limit food intake to eight hours per day with daily fasting for 16 hours. This is one of the most popular and "doable" forms of fasting because there are zero complex rules or regulations. Simply put, you eat during your eight hours and don't eat for the remaining 16 hours.

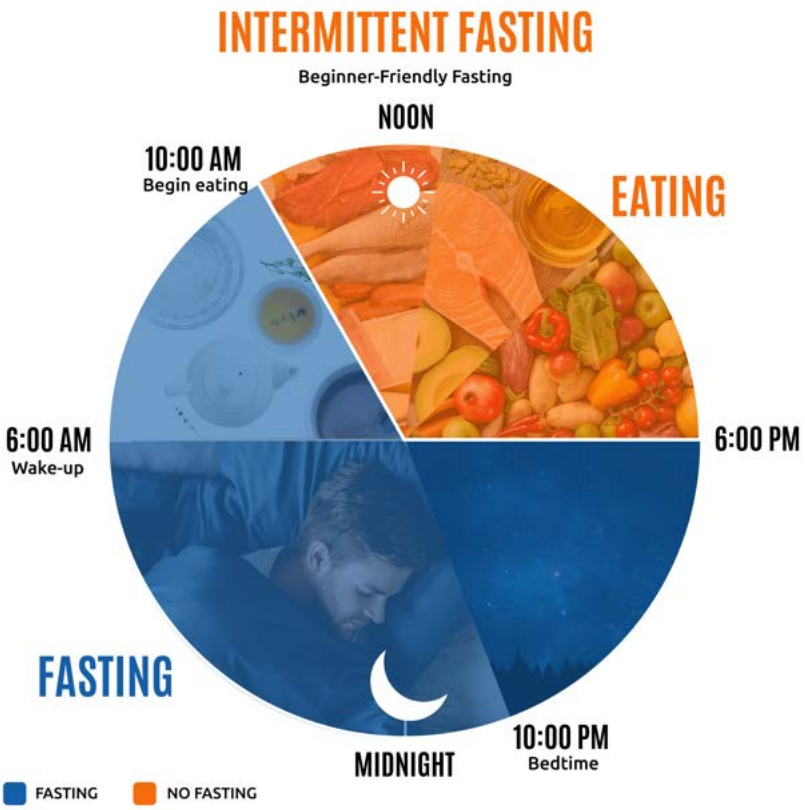
How to Get Started:

The first thing you need to do is decide what your eight-hour feeding window will be. Many people base this off their normal dinner time. If you normally eat dinner at 6 pm in your household, then start fasting as soon

as you're done and begin eating 16 hours after that. And yes, the time you are sleeping does count as part of the non-eating hours. The key to making this fast work for you is to find a time that fits with your lifestyle and personal preference.

Autophagy Benefits:

Now that you've started with your Beginner-Friendly Fasting, what benefits can you expect to see? After 14-16 hours of fasting, the body lowers, if not completely uses stored sugar (AKA glycogen) from the liver. This is around where fat burning begins as the insulin levels drop and body begins to use its own fat for energy instead of sugar. Your levels of the human growth hormone (HGH) increase, which benefits weight loss and muscle gain. Your cells will begin repairing themselves by digesting and removing old proteins that have built up, also called autophagy.


INTERMITTENT FASTING
Beginner-Friendly Fasting
NOON
10:00 AM
Begin eating
EATING
6:00 AM
Wake-up
6:00 PM
FASTING
MIDNIGHT
10:00 PM
Bedtime
FASTING
NO FASTING

Graphic 5

2) Female-Friendly Fasting

The Female-Friendly Fasting option is meant for those of you in the "Fasting Farrah" group. Why do women need a separate fasting option? Not all women do. There are many women who will be fine with the any of the other options listed in this guide but there are others who've dabbled with intermittent fasting and suffered from an insatiable appetite, no weight loss (or even weight gain), poor blood glucose regulation, fatigue/energy drain, brain fog, disrupted menstrual cycles, low libido, and thyroid issues to name a few. BUT this is not meant to scare you off, ladies. If nothing else, these case reports provide evidence that **there's no one-size-fits all diet**. There is not one thing that works for everyone, and what's more, what "works" for you now may not be the right fit for you at another point in your journey. Many women start fasting at 6 pm after dinner but some find they prefer to have a great breakfast and have no desire for a hearty dinner. You must decide what fits your preferences and go from there when deciding on the time to start your fast.

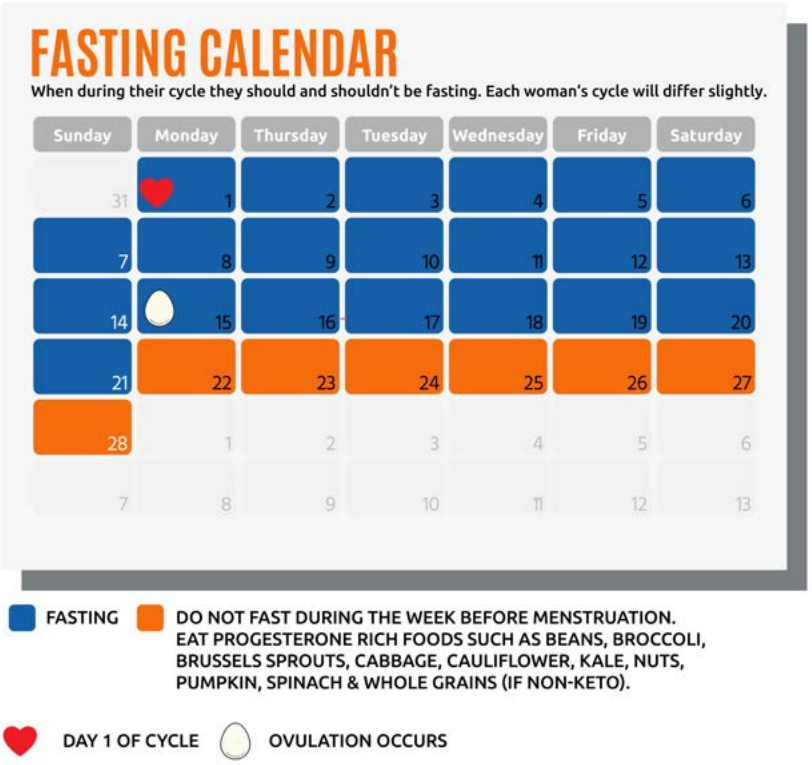
There are many factors a woman must consider before attempting any type of IF. There are some cases where fasting will not be healthy or safe for a woman. The first would be if you are lean with a body fat percentage between 12-16%. This puts you in a higher risk category and you should consult a doctor for attempting a fast. If your body fat percentage is below 12% then you should not do a fast right now and again, consult a physician. Women who fast should also have a healthy menstrual cycle. If you have an irregular menstrual cycle, then you should speak to your doctor and not fast until you can get your menstrual cycle normalized.

The other times where a Female-Friendly Fast may be a good option for you is if you're actively trying to get pregnant, or you are currently breastfeeding. But, if you are pregnant, breastfeeding, or trying to get pregnant, it is extremely important that you work with your physician, so that you can be sure you are meeting your caloric needs.

It is also important to note that if you have adrenal fatigue, then fasting for anything greater than 13 hours is likely not appropriate. Regardless

though, always speak with your physician before beginning any type of diet or fasting program.

One additional item I want to mention is that you should fast based on your cycle. Because your estrogen levels experience a steep drop during the week prior to your period, you typically experience cortisol sensitivity (stress hormone). Because your body Is more sensitive to stress, staying away from anything else, like IF, that will add more stress to your body is a good idea. The general rule of thumb then is to fast during days 1-19 of your cycle and eat a "normal", healthy diet during days 22-28.[2]

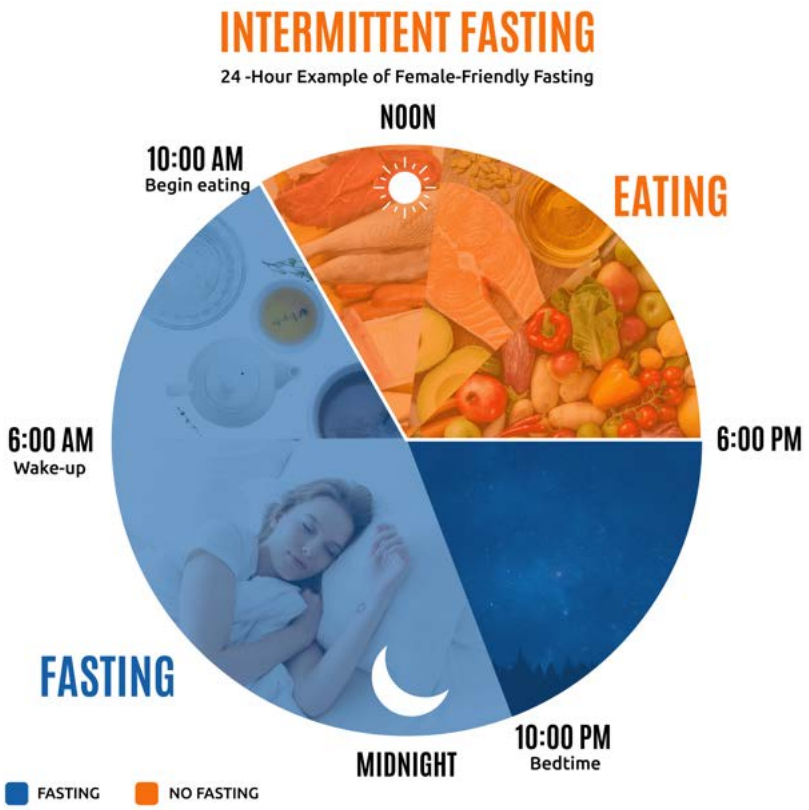


Graphic 6

As a female, if you are unsure about fasting, this could be a good way to start. It eases you into it so that you can judge how your body is reacting before attempting to jump into a more intense form of fasting.

How to Get Started:
The Female-Friendly Fasting option follows a Crescendo Fasting pattern. This is a modified approach that combines elements of two popular intermittent fasting methods: time-restricted eating and alternate-day fasting. You fast for 12-16 hours per day for 2-3 non-consecutive days each week. Non-fasting days follow a regular diet. For example, fast Monday, Wednesday, Friday and eat Tuesday, Thursday, Saturday, and Sunday. Make sure to tailor the days to your eating and workout needs.

Autophagy Benefits:
The benefits here are the same as beginner fasting benefits. Over time, your appetite decreases and you are snacking less so weight loss, increased HGH, and insulin reduction can all occur. The main downside would be that not as much cell cleaning will occur but when weighed against the other potential issues' women may experience, it seems a fair trade.



Graphic 7

3) Flexible Fasting

For all the Flexible Frannies and Franks, there is Modified Alternate-Day Fasting aka "Feast-Fast". This is a heavily researched form of intermittent fasting and is great for people whose schedules are more inconsistent. There is considerable flexibility on "feast" days meaning you have greater flexibility on the quality of food intake because overall you're snacking less, and there is less "damage" happening to your body as GH, autophagy, growth and recovery factors are all higher, insulin, inflammation, blood sugar, glycation, resources for digestion/absorption/utilization are all lower. Snacking less instructs the body for large amounts of food or no food,

your appetite and metabolism adjusts. You stop "running the machine" all the time with all these snacks and eating throughout the day.

How to Get Started:

While this option has more flexibility in terms of schedule and food, it's important to figure out what days are best for you to feast and fast. If you are working out or there are days when your energy need should be higher, it is best to schedule that for feast days. You will alternate "feast" and "fast days, eating (whatever you like) until satisfied on feast days. Pro tip — if you keep your diet healthy, you will be more satisfied on feast days. On fasting days, you are permitted to eat a small (≥ 500 calories) dinner, but it is not necessary. It is Ideal for your fast hours to be 24 hours (i.e., dinner to dinner) or 36 hours (i.e., dinner to breakfast).

Autophagy Benefits:

The benefits here are the same as all the other forms of IF—weight loss, increased HGH, insulin reduction—up to the 24–36-hour mark. Cell cleaning will not peak, but it will begin. The biggest benefit most people see in choosing this type of fast is its flexibility. Get started at 6pm after your dinner.

4) Pure Fasting

Pure Fasting, AKA Periodic Fasting, is the fast for Detox Dani and Danny. This fast is easily the strictest one of the four we're discussing. You fast for about 36 hours out of the 48 hours (two days) per week. Your diet should be healthy but normal on the other five non-fasting days. It's important that you choose your fasting days to be on less active (i.e., recovery) days when your energy needs are lower.

How to Get Started:

When planning this fast, make sure that your 36 hours account for no food intake on two non-exercise days. This allows the body to use its own fat for energy. The scientific term for this autophagy literally translates to "self-eating." A common question with this fast is will you will lose muscle with pure fasting. The answer is no. It is easier and less work for the body

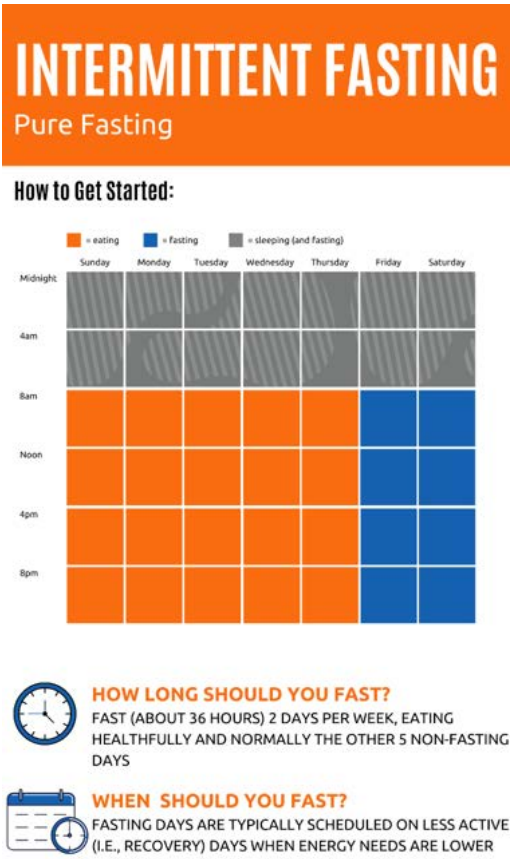
to auto-digest fat. The body prefers NOT to break down its muscle. It's too much work when an easy option is right there. For the absolute best results during pure fasting, make sure you enjoy a healthy, balanced diet during the remainder of the week while training.

Autophagy Benefits:
Why would you choose this fast over the others? This option gives you the same benefits as the previous fasts but with more bang for your buck. Pure Fasting allows the body to *fully* utilize its own fat stores for fuel. These energy molecules are called ketones and during this fast, you are now in a ketogenic state.

What is a ketogenic state? In a ketogenic state there is decreased inflammatory products created when glucose is burned for fuel and the inner cell cleanup begins. You can expect the following to occur:

- Mental clarity
- Inflammation starts to decrease
- DNA damage is broken down and repaired (reducing risk for cancer)
- At 24 hours, lysosomes start breaking down old cell components and misfolded proteins
- The growth factor hormone is released (think lean muscles)
- At 36 hours autophagy as at 300% more than at the beginning of your fast
- If prolonged by an additional 12-24 hours, the body is more sensitive to insulin (lowers risk for diabetes) and autophagy has peaked
- All the old white blood cells (the cells that fight infection) are thrown away and new ones are being made

Pure Fasting is the most intense fast of these four fasts, but if you're looking for the most benefits then this would be the one method I'd choose.



Graphic 8

There are two groups of people that are not included in the above groups. The first is older adults and the second are those who want to use IF as part of a health protocol e.g. for cancer mitigation or reversal. For either group, IF can provide benefits but there are a lot of other factors that need to be taken into consideration such as whether you have a lighter bodyweight or take certain medications. Before making changes to your eating plan, make sure you check with your doctor before trying some type of IF.[3]

IF is a broad term that refers to dietary approaches in which individuals go extended periods of time (typically, 12 – 48 hours) with little or no caloric intake, with intervening periods of normal intake, on a recurring basis.[4] Although that definition is fairly clear-cut, the truth is that there's quite a bit of confusion when it comes to IF because it encompasses several different eating patterns, or subclasses. I'm hoping that you have been able to find yourself in one of the four groups above and that the breakdowns help make IF something you are more comfortable exploring.

For those of you who have more experience with IF, or once you have tried out one of the previously discussed forms of IF, I encourage you to dive into the next section of this guide, *The Ultimate Fasting for Energy Guide – Advanced Section.* It is here that I will discuss more of the science behind fasting and go into detail about the many subclasses of IF.

ADVANCED SECTION

Now that you're more advanced and have some fasting experience, let's dive into more nuanced fasting methods for you to experiment with.

Here are some of the most common examples of Intermittent Fasting:[5]

Graphic 9

Time-restricted feeding (TRF)

This is the most popular form of IF, which involves restricting food intake (often referred to as a "feeding window") to specific time periods of the day, typically 8 hours or less. For example, one might fast for 16 hours followed by an 8-hour feeding window. *The Warrior Diet* is an example of TRF as is the popular IF method Leangains. ("Beginner Fasting" and "Female Friendly Fasting" from above would be included here).

Alternate-day fasting (ADF)

This involves alternating "fasting" days (no calories) with "feast" days (unrestricted food intake). In other words, eat nothing one day, then eat to your satisfaction the next. Some refer to this method of IF as "zero-calorie" ADF to distinguish it from…

Alternate-day modified fasting (ADMF)

This variation of ADF restricts calories to about 75% of your baseline needs on "fasting" days (about 500 calories/day), which are alternated with unrestricted "feast" days (*ad libitum* food consumption). *The Every Other* Day *Diet* is an example of ADMF, and it's based on the research of Dr. Krista Varady (who's also the co-author). ADF and ADMF are the most studied forms of IF in humans. (This includes "Flexible Fasting" from above).

Periodic fasting (PF)

This IF eating pattern, which is sometimes referred to as "whole-day fasting," consists of 1 – 2 days of fasting along with *ad libitum* food consumption the other 5 – 6 days of the week. (This includes "Pure Fasting" from above.) One popular example is Brad Pilon's *Eat Stop Eat* program. A modified version is the *2-Day Diet* (also known as the *5:2 Diet*, or MPF), which involves 2 consecutive days of calorie restriction (about 500 – 700 calories/day) followed by 5 days of "normal" eating. PF can also include water fasts, which often last 2 – 5 days.

Fasting mimicking diets (FMD)

As the name implies, FMD is designed to mimic the physiological state of fasting *and* provide many of the benefits – without actually fasting. FMD is based on research conducted by Dr. Valter Longo and colleagues, and it hinges on a 5-day period of calorie restriction during a monthly cycle. During this 5-day period, you consume a very-low-calorie diet (about 34 – 54% or your normal intake, or about 800 – 1100 calories per day) that's also very low in protein (about 10% of your normal intake). The rest of the month, you eat normally, and this cycle is typically repeated at least three

times. If you're interested in learning more about FMD, *The Longevity Diet* (by Dr. Longo) and ProLonFMD.com are excellent resources.

Intermittent Fasting Cheat Sheet

	Fasting Period	Refeeding Period	Allowed during Fasting	Hack your Fasting State	Alternatives or good sources for more
Time-restricted feeding (TRF)	16 hours	8 hours	Water, Coffee,Tea	MCT Oils, Exogenous Ketones	Warrior Diet, Leangains
Alternate-day fasting (ADF)	24 hours	24 hours	NO calories	MCT Oils, Exogenous Ketones	"Zero-calorie" IF
Alternate-day modified fasting (ADMF)	24 hours	24 hours	500 calories/day	MCT Oils, Exogenous Ketones	The Every Other Day Diet
Periodic fasting (PF)	24-48 hours	5-6 days	500-700 calories/day**	MCT Oils, Exogenous Ketones	"Whole-day fasting" & 2-Day Diet
Fasting mimicking diets (FMD)	5 days restricted food intake	8 hours	34 – 54% of your normal intake.*	MCT Oils, Exogenous Ketones	The Longevity Diet

* or about 800 – 1100 calories per day.
** PF can also include water fasts, which often last 2 – 5 days.

Graphic 10

Intermittent Energy Restriction (IER)

Another key term that also gets bundled with IF which is defined as periods of caloric restriction interspersed with normal calorie intake. As you can tell, pretty much all the IF protocols qualify as IER. However, it's important to distinguish IER regimens that *allow* food on restricted days (such as ADMF and the 2-Day Diet, for instance) because complete abstinence (i.e., true fasting) *may* cause the brain to send signals that make you eat more (a term we scientists call ***hyperphagia***).[6]

Also, the IER distinction is key to make for two other reasons:

1. Continuous Energy Restriction (CER)

By now, most people know that weight gain is the result of eating more calories than you need. Think of CER like this:

Your body is like a car and food is gasoline. If you do not drive very far and always fill 10 gallons in the gas tank, the gas tank will overflow what you do not need. Your body is like this except the excess food you eat but do not burn turns into fat.

If you need to drive 500 miles but only put in ¼ tank of gas, you will burn your fuel before you reach your destination. If you do not have adequate calories (fuel) for exercise and to keep your body's engine running, you will poop out and feel exhausted.

Health problems related to excess body fat:

- Type 2 Diabetes
- Heart disease and high cholesterol
- Reduced energy and brain fog
- Reduced ability to move well (exercise, flexibility)
- Increased risk of early disability and even death

Benefits of intentional weight loss

- Improvement of already diagnosed type 2 diabetes and high cholesterol
- Improved ability to exercise
- Improved brain function and overall sense of wellness
- All the autophagy benefits

BONUS WITH IER: Compared to the difficulty some people have with daily calorie restrictions with caloric energy restrictions for weight loss, with IER some days you can eat more; others, eat less.[7]

2. Calorie restriction (CR)

- The basic definition is limiting your calorie intake to about 60% of your needs FOREVER (ok most of your life)
- Calorie needs are individually dependent on sex, age, height/weight, and activity level, muscle mass and will fluctuate throughout your lifetime.

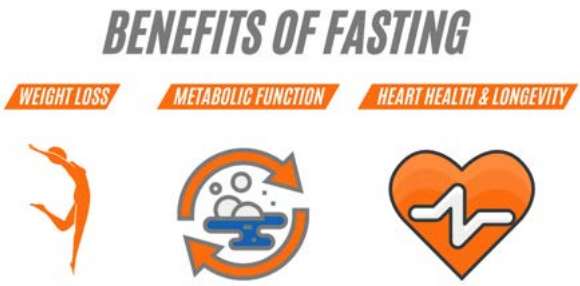
CR benefits

- Great for preventing diseases like diabetes, heart disease, high cholesterol, dementia
- Reduction in tumors and cancers. Did you know most cancer cells depend on sugar to keep replicating?
- Increased lifespan with less age-related decline
- Improved metabolism
- **Autophagy!** Decrease in overall inflammation in the body. The way sugar is broken down into energy for the body is done in a series of highly complex chemical reactions. When the sugar molecule breaks down, the by-products of the process can harm the cells, especially the cells responsible for making the fuel we need. The fancy schmancy way to say this is that CR decreases oxidative stress and improves mitochondrial function.
- **Benefits of IER may be *stronger* than CR** because of the more intense – albeit less frequent – degree of calorie restriction.

CR drawbacks

- Eating about 40% less all the time? Many people are always feeling hungry. That is hard and frankly, kind of stinks.
- Higher risk of not being able to sustain this long-term with more fluctuations in weight.
- Not as well studied in humans compared to other forms of IER.

POTENTIAL BENEFITS OF INTERMITTENT FASTING



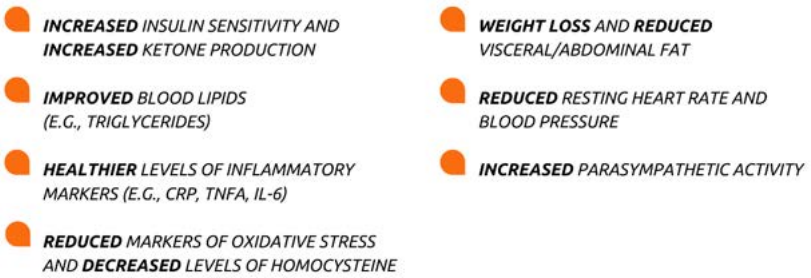
Graphic 11

Weight Loss

- IER is an alternative to daily caloric restriction (CER).
- Studies conclusively show that the various forms of IF are at least as effective as CER at reducing body weight, and body fat, including the fat surrounding the body's organs.[4,5,7]
- Weight loss occurs from cutting calories or burning more than you eat. TRF works well because most people reduce how much they eat when they limit the number of hours that they are allowed to eat in a day rather than the fast itself.
- Many find IF is easier to stick with compared to traditional diets that limit calories and types of foods that can be eaten which equates to taking it off and keeping it off.
- Additional benefits beyond weight loss specific to IF, and certainly, some people find that it's easier to stick with IF compared to the traditional dieting approach, when it comes to weight loss.

Improved Metabolic Function

- Research shows that IF (such as ADMF and MPF) leads to significant changes in metabolic function and **autophagy.**
- These changes include increased insulin sensitivity, reduced levels of blood glucose, insulin, and leptin (a hormone that helps you feel less hungry), increased adiponectin, increased fat burning, and elevated levels of ketones (more on this in a moment), which are known to have beneficial effects on cells with a high energy demand, such as neurons in the brain.[8] Interestingly, research shows that IF increases insulin sensitivity to a greater degree than CER despite similar weight loss, and IF also appears to be a tool that can stimulate mitochondrial biogenesis, which is science speak for increasing the size and number of mitochondria.



Graphic 12

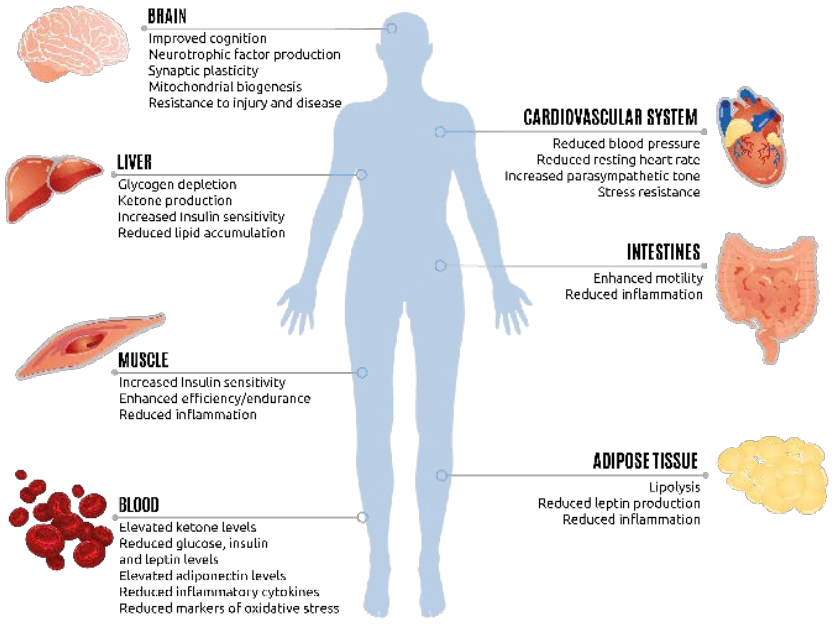
Heart Health and Longevity

The various IF regimens have been shown to improve a variety of cardiometabolic risk factors including:[4,5]

- Increased insulin sensitivity and increased ketone production
- Improved blood lipids (e.g., triglycerides)
- Healthier levels of inflammatory markers (e.g., CRP, TNF**α**, IL-6)
- Reduced markers of oxidative stress and decreased levels of homocysteine
- Weight loss and reduced visceral/abdominal fat

- Reduced resting heart rate and blood pressure
- Increased parasympathetic activity ("Rest and Digest not "Fight or Flight")

Examples of how the human body responds to IF.[5]



Graphic 13

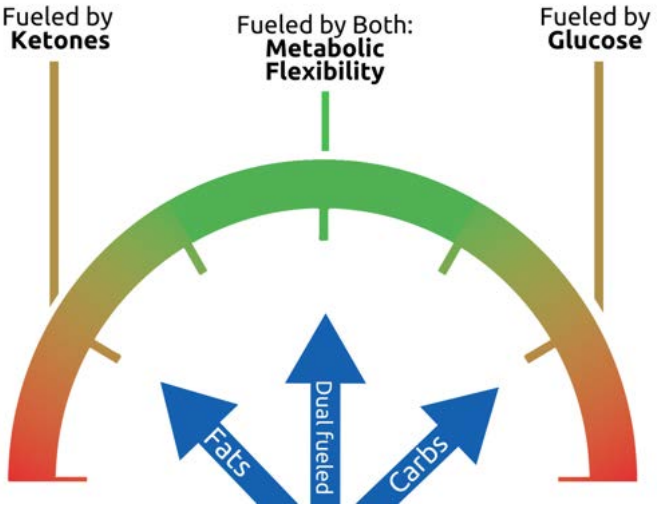
Benefits of Intermittent Fasting

In a paper recently published in the *Journal of the American College of Cardiology*, a group of researchers led by Dr. James O'Keefe, MD, a cardiologist and medical director of the Duboc Cardio Health and Wellness Center at Saint Luke's Mid America Heart Institute, sought to identify the "ideal" or "optimal" human diet, which they summarized as a "Pesco-Mediterranean diet with intermittent fasting".[9]

More specifically, the authors recommended daily time-restricted eating whereby intermittent fasting is done for 12 to 16 hours each day (with an eating window of 8 to 12 hours). While they advise that no comparative studies have been performed to assess the optimal time window, they do suggest eating 2 rather than 3 meals and compressing the calorie-consumption window.

According to the paper's authors, "Intermittent fasting when done on a regular basis has been shown to decrease intra-abdominal adipose tissue [i.e., belly fat] and reduce free-radical production (That cell damage which ages the body from the byproduct of too many calories being taken in being talked about **AGAIN**). In addition, the study shows the cells work better and more efficiently to decrease inflammation and make metabolism of sugar more efficient over time while also decreasing risk of diabetes, heart disease, cancer, and dementia/Alzheimer's. As humans this process is ancient and has been preserved as humans evolved.

The paper was careful to (accurately) point out that, while an effective tool for weight loss, time-restricted eating is not more effective for weight loss than standard calorie-restriction diets. The authors highlight that certain benefits of time-restricted eating and intermittent fasting may hinge on the body shifting from utilizing predominantly glucose/carbohydrate to a heavy reliance on fat/ketones -- what other researchers have deemed as "flipping the metabolic switch". Ketones are the body's fuel source when fat is broken down for energy. Hence where the "Keto Diet" stems from.



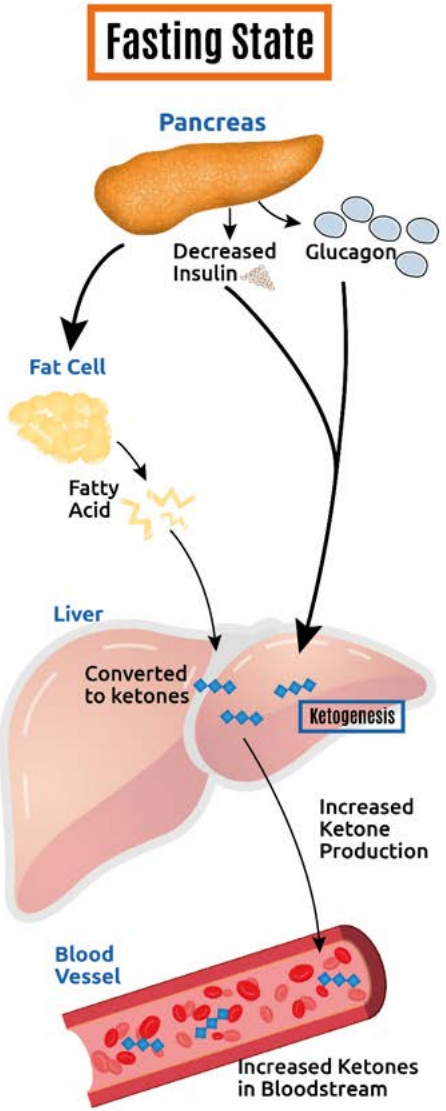
Graphic 14

Ketone bodies regulate how proteins act and are expressed in the body which influences health and how we age. Ketone bodies stimulate expression of the gene for brain-derived neurotrophic factor, which has implications for brain health and psychiatric and neurodegenerative disorders.[10] Fancy for saying helps the brain function optimally and reduces chances for Alzheimer's Disease. Ketones can lead to marked improvements in health and metabolic biomarkers even without weight loss, according to findings reported in a study published in the journal *Cell Metabolism*.[11]

In this particular study, men with prediabetes were randomized to early time-restricted feeding Early time-restricted feeding improved insulin sensitivity, pancreatic function improved blood pressure, and decreased cell damage even with minimal weight loss. IF is not a fad diet.

IF helps the brain and **nervous system** (increased parasympathetic activity, reduced heart rate and blood pressure).[4]

Ketone Production by Liver
During Fasting Conditions (Ketosis)



Graphic 15

INTERMITTENT FASTING FOR WOMEN CAN WORK

There's a good chance that, before you cracked open this guide or *The Energy Formula*, you've at least heard about intermittent fasting.

On one hand, you may have heard that it's the best thing since sliced bread. All you have to do is worry about *when* you eat; you don't have to be overly restrictive with *what* you eat, you don't have to count calories, and you're afforded quite a bit more dietary flexibility—as long as you eat within a pre-determined window of time.

On the other hand, you may have heard horror stories, particularly from women that have tried fasting, either extended or intermittent and dealt with frustrating consequences, such as:

- Insatiable appetite
- No weight loss (or even weight gain)
- Poor blood glucose regulation
- Fatigue/energy drain
- Brain fog
- Disrupted menstrual cycles
- Low libido
- Thyroid issues
- And more

This is not meant to scare you off, ladies. If nothing else, these case reports provide evidence that **there's no one-size-fits all diet or type of fasting (hence this guide)**. There is not one thing that works for everyone, and what "works" for you now may not be the right fit for you at another point in your health journey.

Intermittent fasting for women CAN work—except when it doesn't. And when it doesn't seem to be the right fit and goes awry, it has less to do

with intermittent fasting than it does with the female body's perception of energy availability. Let me explain.

Women's Bodies are Smarter, Stronger, and More Complex

From the onset of puberty all the way through menopause, women, on average, maintain a greater percentage of body fat than men despite less caloric intake (relative to lean body mass) and use fat as fuel during exercise compared to men.[12] Despite eating less and burning relatively more fat during exercise, women tend to store more-fat than men. The reason for this is that fat, which is made by cholesterol, is needed for women to produce estrogens (beta-estradiol & estrone) as well as DHEA, testosterone, progesterone, pregnenolone and more.

Female bodies seem to "defend" body fat more aggressively than males to prepare for conception and the ability to carry a baby to term. Of note, every woman is different and needs a different amount of body fat to produce estrogen and progesterone.

It's important to note here that stress affects sex hormones which affects your cycle. So, if you are already too stressed then adding more stress in the form of IF—especially before your cycle—can cause an imbalance in your hormones.

This brings us back to Leptin, the hormone responsible for feeling less hungry. **Women are much more sensitive to the threat of energy restriction**.

For example, in a study published in the journal *Metabolism*, researchers found that leptin levels dropped significantly in both men and women following just 7 days of a reduced-calorie diet. But here's the kicker: While the guys' leptin levels decreased 36%, on average, the **women's leptin levels plummeted a massive 61%.**[13] Yes, the women had higher levels to begin with, but that difference is normal and is null when adjusted for circulating concentrations of sex hormones.[12]

Another hormone, **ghrelin,** AKA "The hunger hormone" stimulates appetite and turns on reward centers in the brain (driving you to eat calorie-dense, highly-palatable foods…and lots of them). Ghrelin is leptin's balancing hormone. Therefore, when faced with reduced energy availability (i.e., caloric restriction), **women demonstrated greater appetite, food intake, and hunger hormone responses to compensate for the effects of leptin** (e.g., ghrelin, PYY).[14]

Here's something else interesting about ghrelin: It's an "entrain-able" hormone. What I mean by that is that **the body releases it at "normal", anticipated meal times**. This explains why you likely tend to *feel* hungry around the same times of day—regardless of what you have (or haven't) eaten prior. In other words, ghrelin is not just a "hunger signal"; it also rises "in anticipation of food intake based on learned, habitual feeding patterns".[15] So, If you train the body that anticipated meal times Is just two times a day, then you can train your body to be hungry just two times a day.

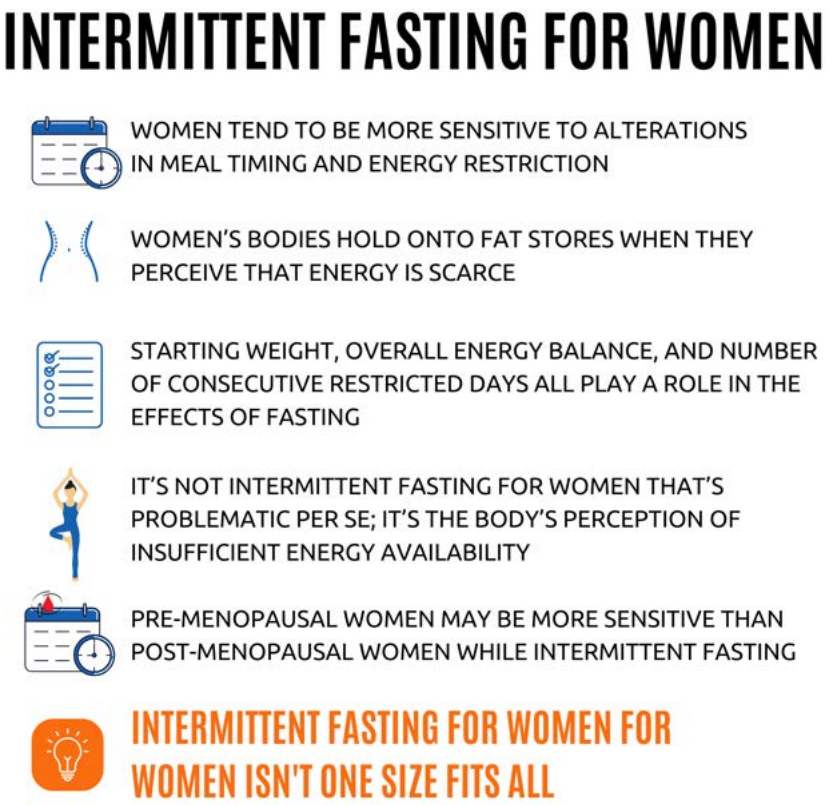
In my experience, **women tend to be more sensitive to alterations in meal timing**—and intermittent fasting certainly involves deviating from one's "normal" eating schedule in some way or another—and elevated levels of ghrelin at anticipated mealtimes (i.e., ghrelin entrainment) may be in part to blame. More precisely, **women tend to demonstrate glucose intolerance and greater swings in glycemic variability**

Practically speaking, women's bodies hold onto fat stores when they perceive that energy is scarce. While we live in the 21st century, our hunger is driven by our "lizard brain". This drives women to feel hungrier and eat more as women's genetically programmed hormones drive the body to be as fit as possible for pregnancy during famine. After all, the evolutionary purpose of all living creatures is reproduction and survival of the fittest. Women's hormones are not regulated knowing the 24-hour Food Lion is open whenever food is needed. Again, no food and body fat mean no **estrogen** and **progesterone** production hence the tendency to lead to more ghrelin and lower amounts of leptin. Without estrogen, the female

body cannot ovulate or menstruate which means she cannot reproduce successfully. In addition, low amounts of estrogen lead to lower sex drives.

Such effects are likely to be related to the starting weight of the individual, pre vs. Post-menopausal, overall energy balance, and the number of consecutive restricted days with intermittent fasting.[16] . Please note that there is no magic number of appropriate body fat. Lean athletic women may want to reduce the amount of IF they do because dropping below a certain percentage of body fat may alter normal hormonal functioning. Some women can menstruate at 10-12% body fat while other women need 15-16% body fat to menstruate regularly.

THE TAKEAWAY: It's not intermittent fasting for women that's problematic per se; it's the body's perception of insufficient energy availability, and fasting is one such threat. The goal is health and autophagy, not being below healthy body fat ranges for optimal functioning.



Graphic 16

The Evidence: Intermittent Fasting for Women

In a recent systematic review with meta-analysis (a critical review of existing research often regarded as the highest form of scientific scrutiny) published in the journal *Obesity Science & Practice*, researchers from Johns Hopkins Bloomberg School of Public Health compared results from alternate-day intermittent fasting (ADF) trials to those of very-low-calorie dieting (VLCD), a common and effective (albeit quite extreme at 800 calories per day) weight-loss strategy.[17]

It is important to note that no gender differences in weight loss have yet been shown in human studies."

The studies that were included in this review, **women represented 92% of the participants in the intermittent fasting trials**. This is important to point out because, in general, intermittent fasting (particularly alternate-day fasting) is heavily studied in women with overall positive results, particularly as "a useful strategy to promote weight loss, without the concern for caloric compensation".[16]

While several studies comparing intermittent fasting to daily caloric restriction have demonstrated comparable reductions in body fat, multiple randomized trials have found that **intermittent fasting leads to greater loss of body fat**.[16,18,19] In other words, intermittent fasting is at least as effective as traditional dieting, and there's some evidence suggesting that it may be superior for weight loss and overall health.

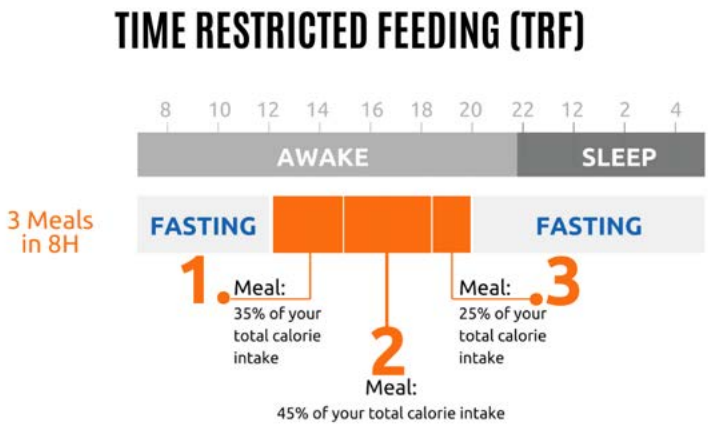
In a recent review study published in the journal *Obesity Research & Clinical Practice*, a group of leading intermittent fasting researchers found that "**males and females achieved similar weight loss**" with alternate-day fasting.[20]

In a study published in the journal *Frontiers in Physiology*, a group of researchers explored the effects of a high-protein, intermittent fasting, low-calorie diet plan on weight loss and other health markers among obese men and women.[21] At the end of the experiment, their results showed reductions in body weight, Body Mass Index (BMI), and blood lipids with "**no sex-specific differences in responses**". Basically, they lost weight and lowered their cholesterol (all good things).

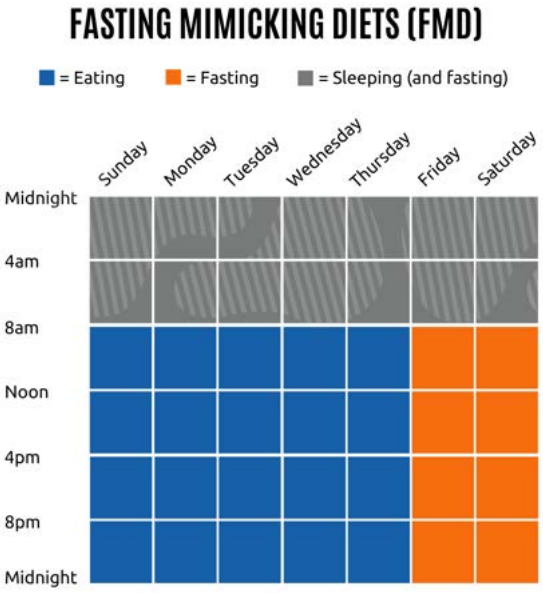
While ADF is the most heavily researched application of intermittent fasting, it's not the most heavily practiced. That crown belongs to time-restricted feeding (TRF), which typically involves daily fasts ranging from 16 - 20 hours interspersed with feeding "windows" of 4 - 8 hours. Despite its popularity, TRF hasn't been studied quite as extensively, and among

the well-controlled human trials, a number of them have involved only men.

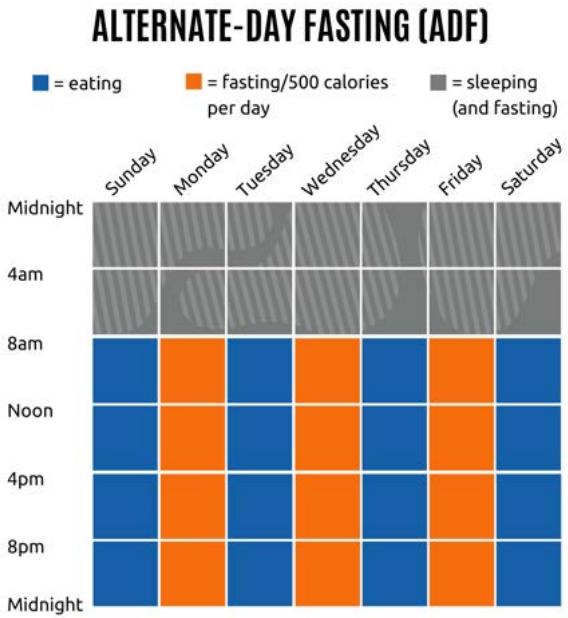
However, it is promising to note that in a trial published in the journal *Nutrition and Healthy Aging*, 23 participants (20 of whom were women) who participated in an 8-hour TRF protocol for (eating as much as they wanted from 10am to 6pm) lost, on average, 2.6% more body weight than a control group over 12 weeks.[22] Although that may not seem like a tremendous amount of weight lost, keep in mind that participants only restricted *when* they ate, not how much.



Graphic 17


FASTING MIMICKING DIETS (FMD)
= Eating
= Fasting
= Sleeping (and fasting)
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Midnight
4am
8am
Noon
4pm
8pm
Midnight

Graphic 18



Graphic 19

Intermittent Fasting for Women Isn't One-Size-Fits-All

Although individual differences apply (as always), intermittent fasting for women CAN work. It's not, however, a one-size-fits-all approach, and generally speaking, women tend to be more sensitive to…

- Changes in caloric intake (i.e., caloric restriction)
- Changes in meal timing/frequency (e.g., hunger hormones, glycemic variability)
- Activity level
- BMI/Lean mass to fat ratio (athletes tend to have lower percentages of body fat and need to be careful not to drop too much body fat to also reduce cardiovascular risk and osteoporosis)

It's also worth reiterating that there are different forms of intermittent fasting that you can "try on". Although time-restricted feeding is the most commonly practiced, alternate-day fasting is actually the most heavily researched, and the participants in those studies heavily favor women. This

allows for a more gradual initiating into the world of intermittent fasting. Depending on how your body responds, you can stick with that approach, or you may experiment with longer and/or more frequent fasts. For example, after 8 weeks of Crescendo fasting, you could attempt full-time time-restricted feeding or a more traditional alternate-day fasting schedule.

WARNING: *Pregnant and nursing mothers, women with an inconsistent monthly cycle, children and adolescents, folks who are severely underweight, and people with probable or diagnosed eating disorders or anyone suffering from adrenal fatigue. If you are unsure if fasting is safe for you, please consult with a registered dietitian and your primary healthcare physician.*

Checklist of Questions to Ask Yourself Before Starting IF for Women

1. How is your sleep?

2. Do you have regular menstrual cycles?

3. Do you feel more stressed than usual?

4. Is your HRV low?

5. Are your cortisol levels high?

If you have answered yes to any of the above questions, then now may not be the right time to try IF. It is true that fasting may help with some of the above problems, but it is always best to work with your physician to make sure you are fasting in the safest way possible for your body.

6. If you are breastfeeding, pregnant, or trying to get pregnant, it is best to consult with your doctor to discuss the possibility of TRF or time-restricted fasting.

SUPPLEMENTS WHILE FASTING

There are many opinions out there about what supplements are best to take while fasting, and there's a considerable amount of debate about what supplements are acceptable in order to maintain fasting.

Graphic 20

These are the only supplements you'd use during the fasting window, there are other supplements useful to support your overall health and fitness goals during eating window.

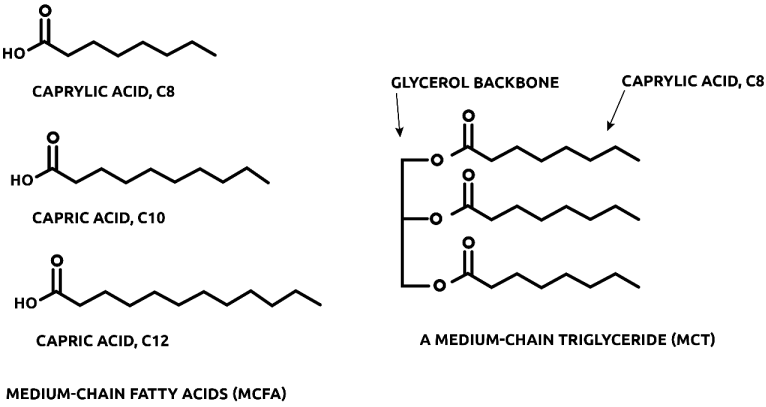
The goal of supplements while fasting would be to augment the many desired benefits that one seeks from fasting (e.g., autophagy, weight loss, appetite reduction, parasympathetic/vagal toning, ketone elevation, resilience/stress resistance, anti-aging, gut rest/healing, etc.). Please note that coffee with cream, Kombucha, and juice are all items that would break your fast.

Category I: Supplements which support ketone production.

C8 MCT Oil. Medium-chain triglycerides (MCTs) -- C8, C10 and C12 -- are metabolized differently than typical dietary fats. Specifically, they are preferentially and rapidly burned for energy and very unlikely to be stored as fat. They have been shown to support cognitive function, increase metabolic rate, enhance fat oxidation and suppress appetite. In particular, C8 is the most ketogenic of the MCTs. Many people supplement with 5 - 15 grams of C8 MCTs. Start on the lower side, gradually working your way up.

Graphic 21

UNDERSTANDING MCTs



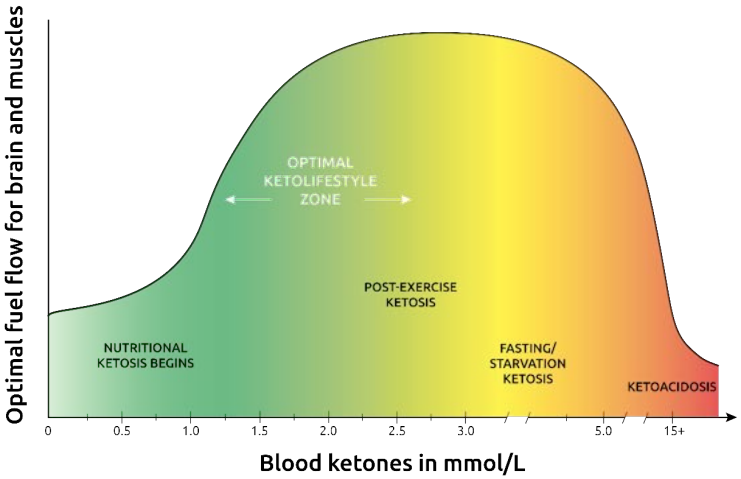
Graphic 22

Exogenous Ketones.

These are ketones very similar to those that the body produces but from an external source. Exogenous ketones help promote the body's ability to flip the metabolic switch in multiple ways by switching to fat metabolism/beginning stages of autophagy. It is important to look for the active isomer D-BHB at 5 - 10 grams per serving and dihydroberberine (100-200mg, twice a day). Exogenous ketones usually provide **electrolytes**.

- Electrolytes such as sodium, potassium, and magnesium fall when fasting due to fluid shifts and insulin levels while fasting
- If you're following a low-carb diet, it can be very challenging to get an adequate amount of magnesium, sodium, and potassium through your diet since they're found primarily in whole, plant-based foods.
- Try to use high quality sea salt (Such as Redmond Real Salt) either directly and wash back with water or in the non-caloric beverage itself (e.g., tea, coffee, water, etc.)

- **HYDRATE and HYDRATE some more.** Water is vital and make sure it contains electrolytes. Consider taking magnesium glycinate for this as well if you are prone to cramping.



Graphic 23

Berberine.
Helps lower blood sugar, it promotes the body's natural production of ketones while lowering blood sugar. Also works on different pathways to promote deep cellular **autophagy.** The Berberine/IF combo complements each other.

Category II branched-chain amino acids (BCAAs) and essential amino acids (EAAs): Keeping and Building Muscle.

- Amino acids are the building blocks of protein. Making muscle, repairing and making new tissue is called anabolism. Consider BCAAs (7g of 2:1:1), EAAs (10g), HMB free acid or L-HICA if you

are working out while fasting to prevent muscle breakdown (catabolism).

- Generally, however, supplementation with amino acids is not fully advised as the metabolic adaptations and autophagy triggered by fasting seem to hinge on low concentrations of fatty acids, glucose, insulin and amino acids.

Category III: Detoxification supplements

- Curcumin
- N-Acetyl-L-Cysteine (NAC)
- Glutathione (liposomal)
- Milk Thistle
- Indole-3-Carbinol, Diindolylmethane (DIM) or Sulforaphane
- Phosphatidylcholine
- Binders (e.g., activated charcoal, clay, aloe vera, pectin and other fibers)
- Apple Cider Vinegar (I recommend Bragg's ACV with "The Mother" for gut health.)

Graphic 24

These are some of other supplements useful to support your overall health and fitness goals during eating window

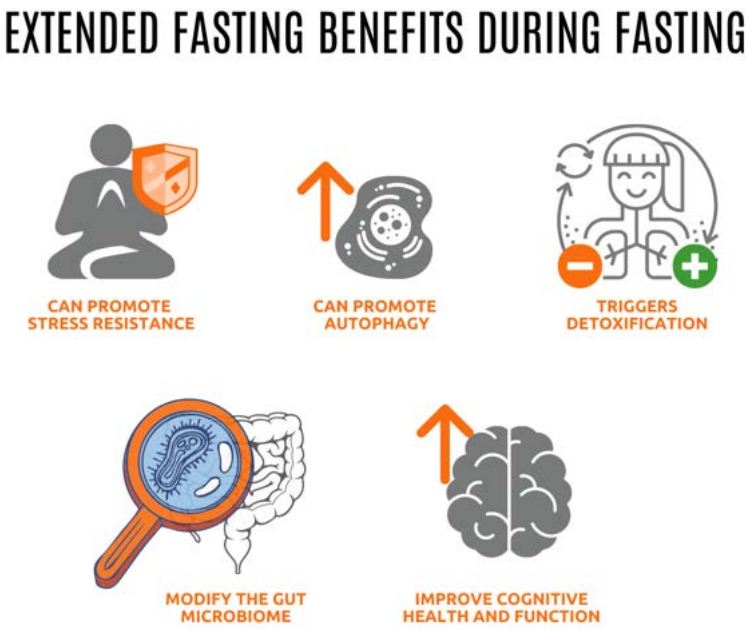
INTERMITTENT VS. EXTENDED FASTING

Up to this point, we've been almost exclusively discussing intermittent fasting, which generally involves periods of fasting lasting between 16 to 48 hours. Extended fasting -- sometimes called periodic or prolonged fasting -- meanwhile, is defined as lasting from 2 to as many as 21 or more days, and this type of fasting is less studied in humans, especially for periods longer than 4 days.[23]

Graphic 25

Benefits

- Animal studies, however, have shown that lifespan and health-span are prolonged with extended fasting, and we would expect amplification of many of the same types of benefits that we see in intermittent fasting.
- Extended fasting can promote ketogenesis, stress resistance and **autophagy**
- Modification, the balance of good vs. Bad gut bacteria (biome), to make the tissue of the digestive tract healthy and efficient for metabolism. Healthy gut bacteria may be linked to lower levels of depression.
- Activation of stem cells which promotes multiple system regeneration
- Increased amounts of mitochondria in cells which equates to a faster metabolism
- **Fasting can put you back in the driver's seat where food no longer has to control you**



Graphic 26

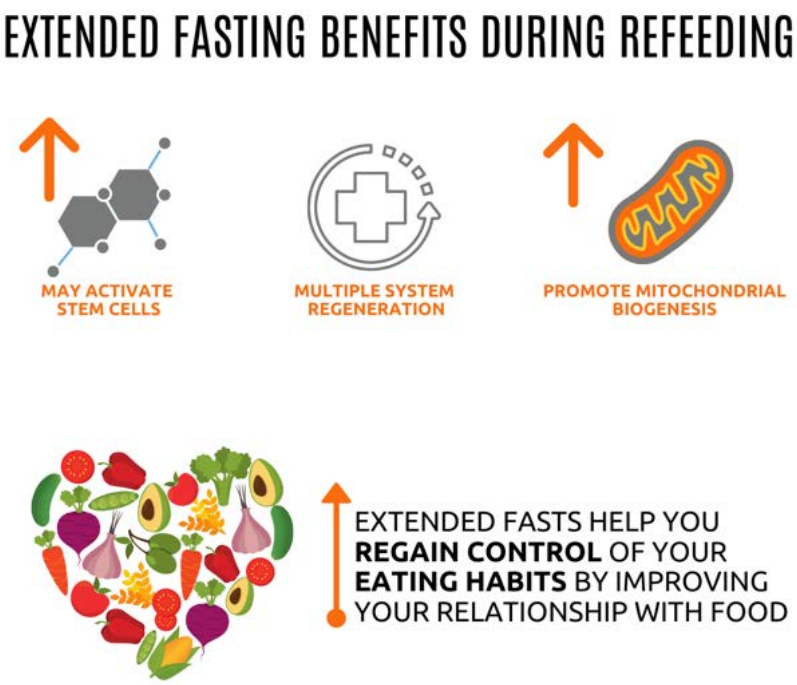
Some Drawbacks

- Can be physically, mentally, and emotionally demanding
- Must be planned out including a "refeeding timeline"
- Intensity of this kind of fast is not to be done more than three or four times per year. You could actually harm yourself if you approach this method too quickly or too often.

As mentioned throughout this guide, it is always recommended that you speak with your physician before attempting any type of drastic changes to your health It also needs said that there are some people who absolutely should NOT attempt extended fasts. These groups include anyone who suffers from an eating disorder, is clinically underweight, is diabetic, has low electrolytes, suffers from dehydration or anyone under significant stress. If your "bucket" is already full because of any of these other

conditions, it does not help to keep filling the bucket until it overflows. There are many instances where extended fasting can help Increase the size of your "bucket" but the above cases are not typically any of them.

If you are planning to try an extended fast, I cannot stress enough the importance of community during the fasting period. You are going to need support from those around you to cope with the demands placed on you physically, mentally, and emotionally.



Graphic 27

Because I have personally experienced the power of extended fasts -- along with so many others in my tribe -- I have created this guide to extended fasts that I think is tremendously helpful. If you'd like to join me and the community in a fasting challenge -- I invite you to do so by clicking the links below:

www.ShawnWells.com
Instagram: @ShawnWells

THE MISSING LINK IN SUMMARY

"Fasting is the greatest remedy, the physician within."
– Philip Paracelsus, Father of Toxicology

By changing the 'when' (which is only amplified by changing the 'what') you can markedly improve your health in countless ways. This is why I like to call fasting the "missing link" in most people's diets), as I can't think of another easier-to-implement tool with such a tremendous upside. In other words, fasting -- in its various forms -- is low-hanging fruit when it comes to…

- Improving body composition
- Tapping into ketosis and "keto-adaptation"
- Improving cognition and brain health
- Anti-aging/reduced biological aging
- Improved resilience/stress resistance
- Lowering inflammation in the brain, gut and body
- Elevating energy levels
- Improving circulatory health
- Regulating appetite
- Improving gut health
- Improving self-control and willpower
- And more!

What's your benefit? How has it changed your life? I would love to hear more about your story. Please contact me through my site and Instagram. Let's do a fasting challenge together and join my incredible community.

If you want more on fasting, keto, paleo, biohacking, stoicism, supplements, anti-aging, exercise hacks and all the latest science on how to have more energy, go to **The ENERGY Formula website!**

DISCLAIMER – Before starting a fast, and before the "fasting police" knock on your door, please read this.

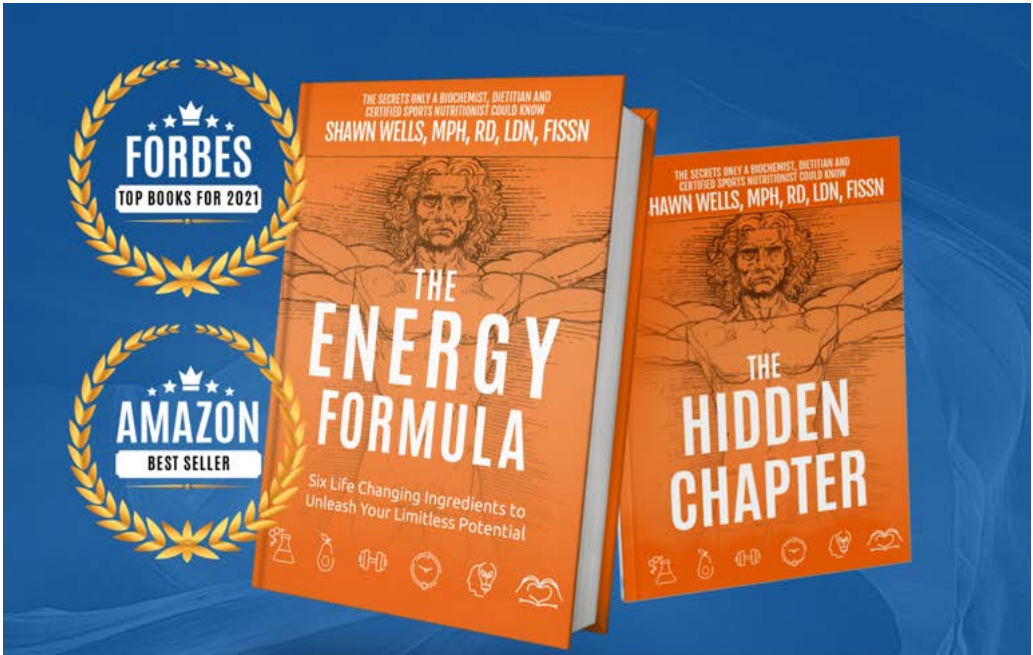
One of the top questions I get asked anytime I'm talking about fasting is "what breaks a fast?" Just like fasting itself, there is a ton of contradictory information out there.

When people discuss "breaking the fast", they are talking about ingesting something that stops the benefits of fasting which are fat loss, autophagy and the elevating of ketones. The obvious answer about what breaks a fast is eating food. But there are many people, who sometimes find it beneficial to include some supplements in a fast such as MCT powder or bone broth. Does it momentarily pause the processes of fat loss, autophagy and the elevation of ketones? Yes, it does. But this isn't a hard start or stop situation. If adding in a bit of bone broth allows you to go a longer period of time in your fast, then your overall benefits are going to be greater, regardless of that momentary stop.

It's important to decide what your fasting goals are because they 100 percent matter. For me, my goals have to do with mindset and willpower. Centering my fast on going a certain amount of time without eating helps me focus and reminds me that I have control over food. It also reminds me of my strength. Having the strength and willpower to do an extended fast is extremely empowering and I can see the benefits of this in other aspects of my life afterward.

Fasting isn't easy so I don't think it's terrible to include supplements if adding them in allows you to enjoy fasting more. If you're enjoying the process, then it is likely you will fast more frequently and reap further benefits from it. Grant yourself some grace to explore what works for you and what makes you stronger and healthier. Don't allow others' thoughts and opinions to take away from doing something that is creating a better and stronger you.

In the "Experiment" and "Growth" chapters of *The ENERGY Formula*, I discuss bio-individuality. It's important to remember that there are no concrete answers that fit everybody. Methods that work for one person don't always work for another, which means we need to experiment to find what does work for us. On this same note, you may need to continue to experiment at different points in your life. Your goals may change, and your bodies will certainly change. You may find yourself retaking the fasting quiz from this guide two years from now and getting a different avatar than you do today, or you may find that fasting a different way provides you greater results. Again, grant yourself grace because either way you look at it, this is your health and your goals, not anyone else's.



PURCHASE YOUR COPY OF THE ENERGY FORMULA AT ENERGYFORMULA.COM

A transparent, vulnerable, and inspiring call to action, **The ENERGY Formula** is a guide meant to bring you out of the black hole of fatigue, depression, and weight challenges and into a more passionate, energized, and vibrant life **NOW**...with expert Shawn Wells as your guide through every simple, research-backed step.

The hardcover book is 400 pages of full-color diagrams, surveys, formulator's corners, resource hacks, product recommendations, and over 100 citations that will help you unleash your limitless potential.

You'll also gain access to The Fasting for ENERGY Guide and other book resources to help you on your journey.

DON'T FORGET TO FOLLOW FOR MORE FREE CONTENT AT

REFERENCES

1. Khatri M. HGH (Human Growth Hormone): Uses and Side Effects [Internet]. WebMD. 2019. Available from: https://www.webmd.com/fitness-exercise/human-growth-hormone-hgh

2. Schneider J. Everything You Need To Know About Intermittent Fasting & Your Period [Internet]. mindbodygreen. 2019. Available from: https://www.mindbodygreen.com/articles/the-one-time-a-month-this-doc-says-not-to-intermittent-fast

3. The Senior Outlook Today Team. The Benefits of Intermittent Fasting for Seniors [Internet]. Senior Outlook Today. 2020. Available from: https://www.senioroutlooktoday.com/the-benefits-of-intermittent-fasting-for-seniors/

4. Mattson MP, Longo VD, Harvie M. Impact of intermittent fasting on health and disease processes. Ageing Res Rev. 2017;39:46–58.

5. Anton SD, Moehl K, Donahoo WT, Marosi K, Lee SA, Mainous AG, et al. Flipping the Metabolic Switch: Understanding and Applying the Health Benefits of Fasting: Flipping the Metabolic Switch. Obesity. 2018;26:254–68.

6. Harvie M, Howell A. Potential Benefits and Harms of Intermittent Energy Restriction and Intermittent Fasting Amongst Obese, Overweight and Normal Weight Subjects—A Narrative Review of Human and Animal Evidence. Behav Sci [Internet]. 2017 [cited 2018 Mar 30];7. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5371748/

7. Trepanowski JF, Kroeger CM, Barnosky A, Klempel MC, Bhutani S, Hoddy KK, et al. Effect of Alternate-Day Fasting on Weight Loss, Weight Maintenance, and Cardioprotection Among Metabolically Healthy Obese Adults: A Randomized Clinical Trial. JAMA Intern Med. 2017;

8. Mattson MP, Allison DB, Fontana L, Harvie M, Longo VD, Malaisse WJ, et al. Meal frequency and timing in health and disease. Proc Natl Acad Sci U S A. 2014;111:16647–53.

9. O'Keefe JH, Torres-Acosta N, O'Keefe EL, Saeed IM, Lavie CJ, Smith SE, et al. A Pesco-Mediterranean Diet With Intermittent Fasting. J Am Coll Cardiol. 2020;76:1484–93.

10. de Cabo R, Mattson MP. Effects of Intermittent Fasting on Health, Aging, and Disease. N Engl J Med. 2019;381:2541–51.

11. Sutton EF, Beyl R, Early KS, Cefalu WT, Ravussin E, Peterson CM. Early Time-Restricted Feeding Improves Insulin Sensitivity, Blood Pressure, and Oxidative Stress Even without Weight Loss in Men with Prediabetes. Cell Metab. 2018;27:1212-1221.e3.

12. Wu BN, O'Sullivan AJ. Sex Differences in Energy Metabolism Need to Be Considered with Lifestyle Modifications in Humans. J Nutr Metab [Internet]. 2011 [cited 2019 May 24];2011. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3136178/

13. Dubuc GR, Phinney SD, Stern JS, Havel PJ. Changes of serum leptin and endocrine and metabolic parameters after 7 days of energy restriction in men and women. Metabolism. 1998;47:429–34.

14. ALAJMI N, DEIGHTON K, KING JA, REISCHAK-OLIVEIRA A, WASSE LK, JONES J, et al. Appetite and Energy Intake Responses to Acute Energy Deficits in Females versus Males. Med Sci Sports Exerc. 2016;48:412–20.

15. Hsu TM, Suarez AN, Kanoski SE. Ghrelin: A link between memory and ingestive behavior. Physiol Behav. 2016;162:10–7.

16. Harvey J, Howell A, Morris J, Harvie M. Intermittent energy restriction for weight loss: Spontaneous reduction of energy intake on unrestricted days. Food Sci Nutr. 2018;6:674–80.

17. Alhamdan BA, Garcia-Alvarez A, Alzahrnai AH, Karanxha J, Stretchberry DR, Contrera KJ, et al. Alternate-day versus daily energy restriction diets: which is more effective for weight loss? A systematic review and meta-analysis. Obes Sci Pract. 2016;2:293–302.

18. Hutchison AT, Liu B, Wood RE, Vincent AD, Thompson CH, O'Callaghan NJ, et al. Effects of Intermittent Versus Continuous Energy Intakes on Insulin Sensitivity and Metabolic Risk in Women with Overweight. Obesity. 2019;27:50–8.

19. Carter S, Clifton PM, Keogh JB. Effect of Intermittent Compared With Continuous Energy Restricted Diet on Glycemic Control in Patients With Type 2 Diabetes: A Randomized Noninferiority Trial. JAMA Netw Open. 2018;1:e180756–e180756.

20. Varady KA, Hoddy KK, Kroeger CM, Trepanowski JF, Klempel MC, Barnosky A, et al. Determinants of weight loss success with alternate day fasting. Obes Res Clin Pract. 2016;10:476–80.

21. Zuo L, He F, Tinsley GM, Pannell BK, Ward E, Arciero PJ. Comparison of High-Protein, Intermittent Fasting Low-Calorie Diet and Heart Healthy Diet for Vascular Health of the Obese. Front Physiol. 2016;7:350.

22. Gabel K, Hoddy KK, Haggerty N, Song J, Kroeger CM, Trepanowski JF, et al. Effects of 8-hour time restricted feeding on body weight and metabolic disease risk factors in obese adults: A pilot study. Nutr Healthy Aging. 4:345–53.

23. Wilhelmi de Toledo F, Grundler F, Bergouignan A, Drinda S, Michalsen A. Safety, health improvement and well-being during a 4 to 21-day fasting period in an observational study including 1422 subjects. PLoS ONE [Internet]. 2019 [cited 2020 Nov 27];14. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6314618/