Metabolic Fasting Protocols

The Evolution of Eating:

Fasting has been a part of the human condition throughout our existence. Humans evolved in a feast or famine reality where the next meal was never assured. Our ancestors had to go long periods of time without food or very little food. Human physiology evolved under this reality.

Because of this, humans developed strong compensatory reactions. In order to motivate us to continue looking for food in the face of food shortages we developed strong biological sensations like hunger and cravings. These strong urges forced us to move constantly in a search of food. This constant movement, it is estimated our ancestors walked about 12 miles a day on average, assured that we were able to maintain our muscle (a muscle that is working is far less likely to be broken down as fuel).

This “involuntary fasting”, is part of the reason our ancestors were far leaner, more muscular and healthier than modern man. Healthier is a relative term of course. While primitive man did not seem to suffer the chronic degenerative diseases of the modern day, they were far more likely to die in infancy, from injuries or infections. This is part of the reason there is a misconception relative to primitive mans average age. The notion that these individuals did not live past thirty is a common misunderstanding of life expectancy. Infant mortality rates were higher in our ancestors driving down average life expectancy. However, those who did make it past infancy were perfectly capable of living long healthy lives. So long as they were not eaten by a saber tooth tiger, or got a deadly infection.

Modern convenience & ancient physiology

In the modern day food is on every corner, is cheap and readily accessible. Consider for a second what this means. You have been programmed through millions of years to make the finding and eating of food a top priority; your survival depended on it. You have developed all these urges to constantly nag at you to find food. Hunger, cravings, and low energy nag at you to feed yourself. Obviously these constant internal drives were a blessing to get you up and looking for food in the days of the stone-age, but today getting food is as simple as taking 5 paces to the refrigerator, or driving down the block for a double-double cheeseburger.

You are at a disadvantage to say the least. For many, the modern environment coupled with these insatiable urges has created a zombie like state where we simply sit on a couch and eat mindlessly all day everyday. The fasted state that was the primary driver of the lean hunter physiology is all but gone in most modern humans.
Bringing fasting back

Mimicking the fasted state of our ancestors can be beneficial not just for fat loss, but for our health as well. But, it is not without risk. For many, especially those who are overweight and “metabolically inflexible”, fasting induces so many negative feelings it becomes virtually impossible. Like a heroin addict surrounded by free drugs and friends shooting up, overweight and obese people are almost powerless to stop the internal biochemical drives and environmental and societal cues to resist bingeing on the most sugary, salty and fatty foods they can find.

However, for the “metabolically flexible”, those without severe hormone resistance, fasting is not only doable, but also beneficial. The metabolically flexible individual need only contend with environmental and social drives and is relatively free of the addictive brain cravings of their hormone resistant, metabolically inflexible counterparts.

So, the first step in understanding if fasting is beneficial for you is understanding your metabolic state. To be clear, fasting would likely be the most beneficial thing a metabolically inflexible person could do……..if they could actually do it. Most often those who try make their issues worse by ending up on a binge eating cycle that starts the day with no food and ends the day in a meal that lasts from 5pm when they get home, to 11pm when they go to sleep. After observing this phenomenon probably a thousand times over the last 10 years, I have come to call it “continuous meal”. And sometimes continuous meal turns into continuous day and continuous week.

Despite what you may have heard or read about the benefits or risks of fasting, you are likely mistaken. Fasting is neither good for everyone nor bad for everyone. In my opinion (which does not mean I am correct), fasting WOULD be healthy and ideal for everyone IF everyone could do it.

What is confusing is the very people who could benefit the most are also the people most likely to 1) not be able to do it and 2) end up making their food issues (both biochemical and psychological) worse. And those who do best are the ones who seemingly don’t need it as much. They tend to be naturally thin and muscular and balanced metabolically.

So, how do you know if you should fast? Ask yourself these three questions:

1. When I get hungry, have cravings or suffer lows in energy do I become overwhelmed and controlled by thoughts of food that don’t go away until I eat certain things (like fatty, sugary, salty foods)?

2. If I had nothing to eat all day, would I be able to come home and eat a sensibly healthy meal until fullness and not feel the need to search the refrigerator and pantry for something, fatty, sugary or salty and eat continuously for the rest of the night?

3. Am I insulin resistant/overweight/obese and feel like I am addicted to food and out of control when I am stressed out, hungry or in certain social situations?

If you answered yes to any of these questions, fasting may be a very slippery slope for you and if you are going to try it, I suggest you start with the modified fasting regimes for “metabolically
inflexible” individuals.

Brief science on fasting

Fasting induces a unique hormonal effect that is not unlike the hormonal effect created by exercise. Insulin will drop and glucagon will rise. Cortisol, adrenaline and noradrenaline will rise. Human growth hormone will increase. All this creates the perfect environment for fat loss.

It is useful to point out here that rising cortisol levels, which many people fear are only and issue when they are present in the context of high insulin levels. When cortisol is “socializing” with HGH, and the catecholamines (adrenaline and noradrenaline), cortisol’s effect is fat burning not fat storing. Add to this the testosterone raising effects and molecular muscle adaptations induced by weight training and even the muscle breakdown properties of cortisol/catecholamines are turned down.

It is interesting to note that there is much metabolic variation between the cortisol/catecholamine raising effects of fasting from person to person. For some, even skipping one meal can cause these stress hormones to be hyper-responsive. This is something you may not see in research on fasted twenty year olds, but is clearly notable in a clinical setting both through symptom evaluation and laboratory measures (blood glucose, salivary cortisol, heart rate, temperature changes, etc.).

I bring this up, because it has been claimed by many that fasting does not raise cortisol or alter blood sugar levels. In truth, it does in many and when individuals in a clinical setting are studied versus certain populations in research this becomes apparent. With that being said, I regard the higher stress hormone activity from fasting as one of its benefits due to the mechanisms mentioned above.

For those suffering from insulin resistance, who even in a fasting state will have high insulin levels, this rise in stress hormones may not be a good thing. This may explain some of the negative side effect these people complain of when fasting or missing meals, including headache, insomnia, insatiable hunger, unrelenting cravings, low energy, foggy thinking, etc. For those experiencing these sensations on a fast, it is advised you move to another model of eating (i.e. more frequent smaller meals, with a nighttime fasting regime).

Based on my clinical experience, short fasts lasting 12 hours or less seems clinically tolerable for almost everyone. Fasts less than 24 hours work well for most people, except the severely insulin resistant. Fasts less than 72 hours can be beneficial for some, but not most. Fasts lasting longer than 72 hours seem to have more negative consequences than beneficial ones (i.e. loss of muscle, etc.). Clinically, fasts between 16 and 36 hours seem to be the sweet spot for those who are metabolically flexible.

The Metabolically Flexible and Inflexible (The Metabolic Changes of Insulin Resistance)

The final introduction to this fasting manual outlines the metabolic state of insulin resistance. This state of metabolic dysfunction is now a pandemic in the western world. While fasting is perhaps the fastest way to fix the issue, it is also very much like treating your metabolism as if it were a cat you are trying to put in a bathtub. The metabolic compensations and subsequent
eating behaviors that occur as a result of attempting to fast often end up causing more damage in the long run.

In other words, while it would be ideal to have a cat that is “clean”, by trying to force it to take a bath you end up doing all the work, end up with all the scratches, the cat never even gets wet and in the process develops a deathly fear any time you pick it up and start heading toward the bathroom. This is an example of perfect being the enemy of good and pretty much ensures the cat will stay dirty for the foreseeable future.

Fasting can be a great tool for the fat loss lifestyle, but for those just starting out we suggest you eat more of the right things more often and leave your "fasting" to 12 hours of food avoidance every night (i.e. the nighttime fasting protocol below). Less compensatory reactions, good results and the development of a metabolism that may be able to handle longer fasts in the future. It is useful to keep this in mind when reading the coming passages.

**The Inflexible Metabolism (Insulin Resistance):**

Being resistant to a hormone is like walking into a room with a strong smell, when you first enter you are acutely aware of the smell and may cover your nose. But after some time passes, you will no longer be aware of the smell. This is analogous to what happens when the cells in a particular area of the body become resistant to a hormone like insulin, they stop getting its signal.

The most common misconception about Insulin resistance (IR) is that it is all or nothing. There is the assumption that you HAVE or CATCH insulin resistance. People, and even healthcare providers talk about it as if it is always a systemic thing. But it is not. You can be resistant or sensitive to insulin in different areas. This depends on your genetics and lifestyle. Insulin resistance is a precursor to diabetes and one of the things that determines whether you eventually become diabetic or not is the degree of IR and where IR occurs. Usually severe IR in the liver ends up resulting in diabetes.

So, let's review what insulin does when certain body tissues/cells are sensitive to it (normal function):

- In the brain= insulin shuts off hunger
- In the liver= Shuts down gluconeogenesis and increases glycogen synthesis (basically stores sugar and does not use resources to make it)
- In the muscle= increases glucose, fat and protein transport proteins to increase uptake of these fuels/resources (i.e. causes entry of fuel into the cell)
- In the fat= increases entry of fat and decreases the exit of fat (makes the fat cell stingy)

Let’s review what insulin does when your cells/tissue become resistant to it (not normal function):

- In brain= insatiable hunger
- In liver= Increase sugar breakdown and production (i.e. increased blood glucose levels)
- In the muscle= less uptake of fat, sugar, amino acids and other nutrients (i.e. muscle cell starvation and increased blood fats and blood sugar)
• In the fat cell= decreased fat uptake and increased fat released (i.e. high blood fats= high triglycerides that can’t be burned)

So, what does it mean?

Here is what to understand about this. If you have IR occurring in multiple areas, which usually is the case in the overweight and obese, you have many detrimental consequences that completely change the way your metabolism behaves, making you metabolically inflexible.

• Your body is now constantly hungry and wanting to eat ALL the time. You also don’t satisfy easily from meals. There is a disconnect between how much you eat and the feeling of fullness.
• On the one hand, you find yourself overeating all the time, but on the other hand you are unable to get fuel into your cells. You are internally becoming malnourished because the cells can’t access the food you are eating.
• All the blood sugar and blood fats that are unable to feed your cells are forced to hang around in your blood doing damage to your internal organs. Fat that may have been released simply gets restored.
• Your fats cells are usually the last organ/tissue to lose sensitivity so they start packing away the fat pounds and there is a constant flux of fat being released and restored from the fat cells (many diabetic drugs actually help make new fat cells in a desperate attempt to keep the body insulin sensitive)
• As a consequence of this mild cellular starvation, you are becoming depleted in brain chemistry and vitamins and minerals overtime as your body frantically uses resources to attempt to get back to balance. But, this just makes things worse; creating more hunger, more cravings and energy lows.

This is why many who understand this IR issue often say “you are overfed, but undernourished” and “metabolically inflexible” or have a “broken metabolism”.

This is why we say an overweight or obese person has a different metabolism than a thin insulin sensitive person.

Final thoughts

So, with all this in mind, realize there are many different forms of fasting. The goal is to find the one that works best for you, causes minimal if any compensatory reactions, induces fat loss and is something you can easily incorporate into your lifestyle over the long run.

If you are a “metabolically inflexible” person (easily identified by answering the three questions described earlier), or new to the fat loss lifestyle, you will want to stick with the “inflexible protocols”. If you are metabolically flexible, and trying to take your physique to the next level, then you may want to use the “flexible” protocols. Good luck and remember, this is all about being the detective, there is no perfect way, there is only your way. Do what works for you and throw out the rest.

In Health, Fitness and Fat Loss
Jade Teta ND, CSCS
Night Fasting Protocol
(Metabolically Inflexible)

Description:

Any meal, especially those rich in the combination of fat and starch/sugar will elicit a fat storing response if they exceed caloric needs or perpetuate a hyperinsulin state that impedes fat release from the cells. The longer a person can go between meals, the faster resting insulin levels can decrease. However, this can result in compensatory eating behaviors, which obviously results in a worsening of the condition. While not all people will respond to fasting with cravings, uncontrollable hunger and energy lows, many will. By prolonging food avoidance at night while a person is asleep (i.e. nighttime fasting), fasting becomes much more usable and doable.

For those who are especially susceptible to negative consequences from fasting (the metabolically inflexible), use of amino acids can help as well of negative calorie foods can help get some, but not all of the benefits, of fasting (i.e. they may still see great fat loss results, but not some of the most beneficial health effects of fasting).

Relevant science:

Fasting lowers glycogen, increases glucagon, lowers insulin, lowers leptin, lowers calorie load, re-sensitizes hormone receptors and induces autophagy (process where the body’s cells break down, repair cell parts and make cell process more efficient). All of this means greater fat loss and metabolic repair.

BCAA supplements lower cortisol, stabilize blood sugar, suppress appetite and help maintain muscle mass. Negative calorie foods help with appetite and the behavioral component of eating.

Protocol:

- Fast for 12 to 16 hours depending on feasibility and degree of obesity or insulin resistance
- Last meal eaten between 6 and 8pm
- First meal eaten between 8am and 12pm next day
- During fasting time consume only: unsweetened teas, unsweetened black coffee, water, fiber powders or negative calorie foods (lettuce, celery, cucumbers, etc.)
- BCAA supplements can also be used to spare muscle loss and control hunger: 5-10g in morning and 5-10g at night

Exercise: If possible and for best results, exercise on an empty stomach near the end of the fast (e.g. the next morning), be sure to take 5-10g BCAAs pre-workout to help prevent muscle loss and provide energy for the workout

**NOTE** this protocol is for educational purposes only. It is best to use this information as guidance in finding a strategy that works for you. This protocol provides “structured flexibility” giving you guidelines, which you are free to adjust according to your unique needs. Always speak with your physician before making any changes to your diet or supplement regime.
Night Fasting Protocol

( Metabolically Flexible)

Description:

Any meal, especially those rich in the combination of fat and starch/sugar will elicit a fat storing response if they exceed caloric needs or perpetuate a hyper-insulin state that impedes fat release from the cells. The longer a person can go between meals, the faster resting insulin levels can decrease. However, this can result in compensatory eating behaviors, which obviously results in a worsening of the condition. While not all people will respond to fasting with cravings, uncontrollable hunger and energy lows, many will. By prolonging food avoidance at night while a person is asleep (i.e. nighttime fasting), fasting becomes much more usable and doable.

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Protocol:

- Fast for 12 to 16 hours depending on feasibility and degree of obesity or insulin resistance
- Last meal eaten between 6 and 8pm
- First meal eaten between 8am and 12pm the next day
- During fasting time consume only: unsweetened teas, unsweetened black coffee, or water
- Do nothing special after breaking the fast. Eat normally (don’t binge eat, but do not try to regulate calories either).

Exercise: If possible and for best results, exercise on an empty stomach near the end of the fast (e.g. the next morning). Best workouts will be weight training, leisure walking or short duration high intensity cardio. If you have difficulty with your workout intensity, you can break your fast just before the workout with 5-10g BCAAs pre-workout to help prevent muscle loss and provide energy for the workout.

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Modified Fasting Protocols
(Metabolically Inflexible)

Description:
Any meal, especially those rich in the combination of fat and starch/sugar, will elicit a fat storing response if they exceed caloric needs or perpetuate a hyperinsulin state that impedes fat release from the cells. The longer a person can go between meals, the faster resting insulin levels can decrease. However, this often results in compensatory eating and craving behavior, which results in a worsening of the condition. By prolonging food avoidance for short periods of time we can drastically reduce insulin and calorie intake and speed fat loss.

For those who are especially susceptible to negative consequences from fasting (the metabolically inflexible), use of amino acids can help as well of negative calorie foods can help get some, but not all of the benefits, of fasting (i.e. they may still see great fat loss results, but not some of the most beneficial health effects of fasting).

Relevant science:
Fasting lowers glycogen, increases glucagon, lowers insulin, lowers leptin, lowers calorie load re-sensitizes hormone receptors and induces autophagy (process where the body’s cells break down, repair cell parts and make cell process more efficient). All of this means greater fat loss and metabolic repair.

BCAA supplements lower cortisol, stabilize blood sugar, suppress appetite and help maintain muscle mass. Negative calorie foods help with appetite and the behavioral component of eating.

Modified 24hr to 36hr fast
- 24hr fast: Avoid all food starting at between 5-8pm and going to 5-8pm the following day
- 36hr fast: Avoid all food starting at 5-8pm and going to 5-8am on the second day
- Drink at least one gallon of water per day
- Tea, herbal tea and unsweetened, black coffee are fine
- Take fasting beverage every 4 hours while waking: 5-10g BCAA powder, 5-10g fiber powder, 1-2 teaspoons of greens and/or reds powder in 12 to 24 oz. water
- Eat calorie-negative foods as much as you like (celery, cucumbers, lettuce, etc.)

**NOTE** Useful for a weekend fast or as an extended (7-14 days) detox fast. Add milk thistle (140mg 3 times daily standardized to 70-80% silymarin) and alpha lipoic acid (200mg 3 times daily). Optional: Use a pea/rice protein medical food 3 times per day as meal replacements for even longer protocols (4 weeks).

Daylight fast
- Avoid food until 8pm nightly.
- Best when used 1 to 3 times per week (usually following days of heavier eating)
- Stop eating by 10pm
- Drink at least 1 gallon water
- Tea, herbal tea and unsweetened black coffee are fine
- Optional: Take fasting beverage every 4 hours while waking: 5-10g BCAA powder, 5-10g fiber powder, 1-2 teaspoons of greens and/or reds powder in 12 to 24 oz. water
**Exercise:** For best results and maximal fat loss, do short-duration workouts on an empty stomach toward the end of the fast; take 5-10g BCAAs pre-workout to prevent muscle loss. Perform as many 30-60 minute leisurely, slow walks throughout the week as possible. A consistent weight-training regime is absolutely essential to maintain muscle.

**NOTE** this protocol is for educational purposes only. It is best to use this information as guidance in finding a strategy that works for you. This protocol provides “structured flexibility” giving you guidelines, which you are free to adjust according to your unique needs. Always speak with your physician before making any changes to your diet or supplement regime.
Modified Fasting Protocols
(Metabolically Flexible)

Description:
Any meal, especially those rich in the combination of fat and starch/sugar, will elicit a fat storing response if they exceed caloric needs or perpetuate a hyperinsulin state that impedes fat release from the cells. The longer a person can go between meals, the faster resting insulin levels can decrease. However, this often results in compensatory eating and craving behavior, which results in a worsening of the condition. By prolonging food avoidance for short periods of time we can drastically reduce insulin and calorie intake and speed fat loss.

Relevant science:
Fasting lowers glycogen, increases glucagon, lowers insulin, lowers leptin, lowers calorie load re-sensitizes hormone receptors and induces autophagy (process where the body’s cells break down, repair cell parts and make cell process more efficient). All of this means greater fat loss and metabolic repair.

24hr, 36hr fasts
- 24hr fast: Avoid all food starting at between 5-8pm and going to 5-8pm the following day
- 36hr fast: Avoid all food starting at 5-8pm and going to 5-8am on the second day
- Drink at least one gallon of water per day
- Tea, herbal tea and unsweetened, black coffee are fine

Weekend Fast (48-60hrs)
- Weekend fast: Avoid all food after 5-8pm Friday evening and going to either 5-8pm Sunday night or 5 to 8am Monday morning (note, longer fasts are more likely to result in muscle loss and negative side effects)
- Optional: Take fasting beverage every 4 hours while waking: 5-10g BCAA powder, 5-10g fiber powder, 1-2 teaspoons of greens and/or reds powder in 12 to 24 oz. water
- Optional: Eat calorie-negative foods as much as you like (celery, cucumbers, lettuce, etc.)
- Optional: Useful for a weekend fast or as an extended (7-14 days) modified detox fast. Add milk thistle (140mg 3 times daily standardized to 70-80% silymarin) and alpha lipoic acid (200mg 3 times daily). Optional: Use a pea/rice protein medical food 3 times per day as meal replacements for even longer protocols (4 weeks).

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Exercise: For best results and maximal fat loss, do short-duration workouts on an empty stomach toward the end of the fast. For weekend fasts consider as an option taking 5-10g BCAAs pre-workout to prevent muscle loss and maintain intensity. Perform as many 30-60
minute leisurely, slow walks throughout the week as possible. A consistent weight-training regime is absolutely essential to maintain muscle.

**NOTE** this protocol is for educational purposes only. It is best to use this information as guidance in finding a strategy that works for you. This protocol provides “structured flexibility” giving you guidelines, which you are free to adjust according to your unique needs. Always speak with your physician before making any changes to your diet or supplement regime.