Intermittent Fasting: Video Transcript

In this video, we'll look more closely at intermittent fasting, and why you might — or might not — use it with a particular client.

But before we get to the application, let's clarify what our words actually mean.

The word "intermittent" is just a fancy way of saying "sometimes".

And "fasting" is just a fancy way of saying "not eating".

So, intermittent fasting just means, "Sometimes, you don't eat."

Early research into fasting often used what we might call "straight" fasting, in other words — taking in zero energy from food.

So, for instance, in one protocol known as alternate-day fasting, or ADF, one day of eating might be a normal maintenance intake — in other words, the amount of calories from food that someone's body required for normal functions — and another day might be zero intake from food.

Another protocol such as a weekly fast might have one fasting day — again, a day of zero calories — per week.

Time restricted feeding, or TRF, might involve fasting for a certain period of the day, and eating only within a particular, prespecified time period, which we might call an "eating window" — for example, eating only during a few hours in the afternoon and evening.

Fasting during Ramadan is a form of time-restricted feeding, in that observant Muslims might eat only after sunset and before sunrise, then take in zero food during daylight hours.

Some studies have also looked at periodic fasting, or a period of zero energy intake over more than one day — in human studies, anywhere from 2 to 21 days.

While fasting may be part of laboratory studies, in fact all of us fast every day when we sleep, so it's perfectly normal to go for 8 hours or more without eating.

In fact, we have a natural circadian rhythm and response to cycles of light and dark. This includes periods of fasting and feeding — being active and eating during the day, and resting and fasting when it's dark at night.

As research on fasting developed, researchers started looking at whether they could get the same results from energy reduction — in other words, taking in significantly less energy from calories than the body's maintenance needs, but not zero.

This protocol came to be known as intermittent energy reduction, or sometimes eating much less.

So, for instance, if we use an alternate-day protocol, one day a person might eat their normal maintenance level of calories, and then the next day, eat much less, perhaps 500 calories — but again, not zero.

As we'll see in this presentation, research suggests that intermittent energy reduction may give us many of the potential benefits of intermittent fasting without having to go all the way to zero intake — which may be much more practical for many people to do.

This also means that if you're looking at a study on fasting, you might want to check to see what people actually ate on fasting days: Did they eat zero calories, or some calories but not a lot?

One thing that can help us understand how fasting works is to look at the timeline of digestion.

So what happens after we eat something?

In the first 6 hours after a meal, our bodies are busy breaking down, digesting, and absorbing the nutrients and energy from that meal.

Hormones and other chemicals are being released to help with gastric motility (or, moving food through the digestive tract), transporting nutrients around the body, and satiety (or, helping us to feel full).

About 1 to 2 hours after eating, depending what was in our meal, our blood glucose, or blood sugar, level reaches its highest point.

As our blood glucose goes up, our pancreas responds by releasing insulin, to help transport the glucose into our cells.

As you can see, in a normal non-diabetic person, each meal involves a "bump" of glucose into our bloodstream, followed by a corresponding "bump" in the levels of circulating insulin.

Exactly what this looks like will vary from person to person, and depend a lot on what we've eaten, and how much.

So, as we digest, [1] carbohydrates are broken down into simple sugars, [2] glucose is released into the bloodstream, and then [3] insulin helps us store the glucose in our cells.

Conversely to blood sugar, fatty acids from the foods we eat are first taken up into tissues quickly, then slowly released into circulation over time. We'll see this more in a moment.

Around the 6 to 8 hour mark is when we enter the post-absorptive period, when nutrients from the meal we ate are circulating and available for us to use.

So, the question is — how do we get energy when we haven't eaten in a while — in other words, if we don't have energy available from a recent meal?

Somewhere around the 8 to 12 hour mark, our bodies will run out of nutrients and energy from our last meal, and enter an early fasted state. Here is when we start to access stored fuel, such as glycogen that's been stored in the liver.

Eventually, at some point, if we don't eat, we'll go into ketosis, where the body starts to use stored body fat almost exclusively for fuel.

So what's the difference between the fed state and the fasting state?

The fasted state is basically the transition from using nutrients we've eaten, to nutrients we've stored.

In the fed state, we have nutrients that are readily available to us from the digestive tract and bloodstream from our most recent meal.

In the fasted state, we're making use of nutrients that we've previously stored in places like our muscles, liver, and body fat.

Now, you may be wondering: What's the difference between fasting and starvation?

Somewhere around the 48 to 72 hour mark, or around 2 to 3 days after our last meal, when it's starting to look like no new food is going to arrive soon, our bodies start preparing for starvation.

Many physiological processes start to "downshift", in other words, slow down or change, in order to match this ongoing energy deficit.

For example:

Our body temperature and basal metabolic rate — the rate at which our body does daily-life functions and runs cellular processes to keep us alive — slows down.

Our thyroid, which helps to regulate many aspects of our metabolism, slows production.

Growth, repair and recovery slow down because there are no more building blocks coming in.

Digestion and gastric motility — in other words, movement of the digestive tract — slows down, in order to extract whatever nutrients are left.

Reproductive functions slow down or stop, because we don't want to be making any babies during a time of starvation.

And finally, our energy level and level of activity and movement also slow down. We might feel tired and lethargic.

Although it's not necessarily comfortable, lab studies have shown that healthy adult humans can continue to go completely without food for up to around 21 days, and in fact many people in those studies are surprised at how relatively easy it is to do that.

But, after around the 21-day mark, we start to enter the danger zone for serious starvation effects. So, if you're considering a fast longer than a day or two, don't do this alone — get medical supervision!

In case you're wondering, the longest known medically supervised fast of more or less zero energy intake supplemented with vitamins and minerals was over one year — 382 days in a man who started out with a body weight of 432 pounds, or 196 kilograms, and ended up at 235 pounds, or about 107 kilos.

Again, we aren't recommending that anyone do that — and if you're considering a longer fast, make sure to do this while being monitored by a qualified healthcare provider.

So, we can think of the difference between starvation and fasting as the starvation state being basically the transition from safe, "normal" energy restriction to dangerous nutrient scarcity.

What defines fasting vs starvation is how well the body can function.

During fasting, normal metabolic homeostasis (or, our normal physiological balance & processes) as well as critical organ function are maintained.

However, during starvation, they are not.

The ability to go without food varies by species. For instance, a camel can go around 40 days, the record for a “normal” human (i.e., non-obese, non-medically supervised) is around 116 days.

Many animals fast during the normal course of their lives. Mammals, such as bears, that normally fast or hibernate periodically are often higher in body fat, around 35-50%. This is something to keep in mind.

The animal with the record for fasting is the olm, a type of cave salamander, that can live up to years without food.

The differences between species are important to keep in mind when you’re looking at studies that may use animals as the test subjects.

Along with knowing the timeline of digestion, it’s also helpful to know the timeline of metabolic activity.

Our bodies need to maintain organ function (especially brain function) when food isn’t available.

But we can’t store a lot of carbohydrate in our muscles and liver because it's relatively heavy.

One gram of glycogen, or the carbohydrate-based fuel in our muscles and liver, binds about 3 to 4 grams of water along with it. If, hypothetically, we got all our fuel from glycogen for one day, and we needed 2000 calories that day, we’d need around 5 pounds or about 2 kilograms of glycogen.

It’s obviously a bit impractical to carry around 5 pounds of extra weight for every day that we might need fuel, so our bodies have another option, which is lighter and less dense: stored body fat. To get the same 2000 calories a day from fat, we only need about 222 grams, or around half a pound, with no extra water stored.

Thus, fasting involves a shift from using mainly sugar-based fuel, such as glycogen, to fat-based fuel.

Let’s go back to our original graphs of glucose and fatty acids. You’ll remember that as glucose goes down after a meal, fatty acids go up. And, after around a day or two, we might have depleted our body’s stores of glycogen.

This means we need another source of fuel for our brain and the rest of our bodies.

This other source of fuel is ketone bodies, which are chemical compounds such as acetoacetate or beta-hydroxybutyrate, that are produced in the liver mostly from fatty acids, when no carbohydrates are available, such as when we're fasting or starving, or eating zero carbohydrates. These are like the "backup generators" for our body's fuel supplies.

In particular, the ketoacids acetoacetate and beta-hydroxybutyrate can provide an alternate source of fuel for the brain, which is obviously a critical job.

Ketone bodies can also be used for energy elsewhere in the body.

Over time, as we continue to fast, we see a shift from using mostly sugar-based fuels to using almost exclusively fat-based fuels, which means an increase in lipolysis, or the oxidation of stored body fat for energy.

The ability to change our fuel use as a response to the available nutrients — for instance, to shift from a primarily glucose-based metabolism to a primarily fat-based metabolism — is known as metabolic flexibility, and it may be amplified or trained by strategically using intermittent fasting, or intermittent energy restriction.

So what makes fasting potentially something "special"?

Intermittent fasting has a number of features that might make it useful for some people.

First, it allows people to restrict energy — in other words, eat less — in a way that isn't chronic. So, if someone wants to lose weight, they might not have to eat less every single day, as they might on a typical so-called "diet".

Second, it shifts our metabolism from using sugar-based fuels to using fat-based fuels, which may have some metabolic benefits for some people.

Fasting can change our metabolic & hormonal environment.

Fasting changes cell signaling & gene expression — some processes are upregulated or increased, while others are downregulated or decreased.

Fasting can be a temporary "good stress" on the body, almost like a metabolic workout

Fasting promotes "cell cleanup", otherwise known as autophagy.

And finally, fasting can potentially teach us that "hunger is not an emergency".

These features of fasting can then offer some people some possible benefits.

First, if people are eating less, they may be able to lose weight or fat more easily, without, again, having to "go on a diet" and chronically restrict their intake. They may not see some of the common metabolic problems with chronic dieting, and they may get to lose weight or fat without a lot of complex diet rules.

Second, fasting may improve insulin sensitivity — in other words, the ability of our cells to respond to the action of insulin — and glucose tolerance.

Fasting may change our metabolic & hormonal environment... potentially in positive and negative ways.

And, fasting MAY improve longevity. Many animal studies suggest that restricting energy may help us live longer.

Fasting may improve our immunity, and lower inflammation — again, especially if it's intermittent.

It may lower our risk of many chronic diseases, such as heart disease, type 2 diabetes, and some types of cancer.

And, it may help people be less afraid of being hungry, which can help with the psychological aspects of losing weight or fat.

But, importantly, none of these benefits will always happen for everyone.

So, as always, whether any dietary protocol is a good idea depends on many factors.

For example, our genetics may affect our response to fasting, along with epigenetics (for instance, if our parents dealt with nutrient deprivation or famine in their lives, we will likely be more metabolically disrupted).

Duration: How long is the fast?

Schedule: Does it align with natural feeding — fasting schedules of circadian rhythms? How does it fit into your daily routine?

Support: Is someone being monitored / supported by a coach or are they doing this alone — or worse, following the guidance of some self-proclaimed guru on social media?

Diet quality: Are you eating good quality foods, or highly processed, nutrient-poor quote-unquote "junk foods"?

Stress: What else is happening in your life? Fasting itself is a stressor, and it adds to cumulative stress load.

Our biological sex — in other words, whether our body has a collection of characteristics that we would call male or female — affects our response to fasting. Typically, female bodies defend energy balance / body fat more aggressively than male bodies.

Activity: How active are you? Athletes generally shouldn't fast during heavy training or competitive seasons unless there's a really good reason.

Mindset: How are you thinking about food / eating / fasting? Are you able to be calm, sane, and objective, or are you anxious and emotionally reactive about it?

Body weight: What's your starting body weight / fat level?

Diet history: What's your history of dieting and nutrient deprivation?

Species: Humans aren't fruit flies — or any other animal. So, not all studies of fasting will apply to human beings, and certainly not necessarily YOUR life, or your clients' lives.

Fasting may change energy balance... for some people.

Energy balance is the relationship between energy coming in from food, in the form of calories, and energy going out to power our metabolic activity as well as our movement and exercise.

To lose weight, we have to create an energy deficit — in other words, we have to eat less energy than we expend.

One way to create an energy deficit (aside from getting more activity and exercise) is to do a conventional "diet", or caloric restriction (CR), where you just eat less every day.

So, let's say we have a person whose normal maintenance intake is 2000 calories a day, who decides to eat 1500 calories a day, and ends up with an average weekly intake of 10,500 calories.

Another way to create an energy deficit is eat normally or even slightly above maintenance some days, then fast other days.

So, in this example using the same person whose maintenance intake is 2000 calories a day, they might eat 2100 calories on some days, and fast completely on other days.

This ends up giving them the same weekly energy intake of 10,500 calories, but with a different pattern of eating from day to day.

In this case, this person might get the same long-term energy balance and potentially same benefits, but they might notice fewer drawbacks physiologically and psychologically.

For example, on days they ate more, they might be able to train harder, or feel more satisfied, and potentially make it easier to fast on the lower energy days.

Another option might be using time-restricted feeding to just eat one meal less a day, and eating only within a particular window of time, which might end up giving you an intake that looks more like conventional dieting — in other words, eating 1500 calories a day — but without eating smaller meals or focusing too much on calorie counting. This is pretty much the same as "dieting" with a twist.

In other words, IF / IER gives us a way to eat less.

And, when we eat less, we lose weight and fat.

Another aspect of energy restriction and fasting is that we know many organisms live longer when they eat less energy, particularly earlier in their lifespans.

For instance, one study in mice found that mice who had eaten consistently less energy throughout their lives lived 15% longer than the mice who ate normally.

In that same study, when the mice were autopsied after death, researchers also found that the longer-lived, energy-restricted mice had far fewer cancerous tumors than the normal control-group mice — 58% of control mice had tumors, compared to 12% of the energy-restricted mice.

Although caloric restriction may be a promising therapeutic tool, chronic and ongoing energy restriction can cause other problems, as we've already seen.

But, with intermittent energy restriction or fasting, we may avoid many of these problems.

For some people, intermittent fasting or intermittent energy restriction may feel easier than "dieting".

For some people, IF or IER may help preserve lean mass, which is often lost during traditional diets.

And, as we've seen, chronic energy restriction may cause hormonal problems, and thus for some people, IF or IER may help to alleviate or minimize those types of problems.

On the other hand... we might have situations in which intermittent fasting or energy restriction does NOT work well for a particular client.

For instance...

Let's take an example where a person starts to use fasting days as a reason to eat more on non-fasting days. In this case, on non-fasting days, either the person is very hungry, or their thoughts and stories around eating start to involve bargaining and compensation — and they end up eating MORE over a week than they need — a total of 15,200 calories.

The result of that particular pattern of fasting and over-eating might be gaining weight, developing a binge eating or over-eating habit, and other types of metabolic & hormonal problems.

On the other hand, let's take another example where fasting days kick off a habit of ongoing restriction, with the idea that if some restriction is good, more must be better.

Here, we see a person who goes deeper and deeper into restricting their energy and eventually a pattern of disordered eating.

The result of that particular pattern of fasting and under-eating might be losing too much weight too quickly, developing a habit of over-restriction, and other types of metabolic & hormonal problems.

For some people, fasting may indeed improve their metabolic health.

But...

It's hard to know whether IF / IER was "the reason" for most beneficial effects.

For example ... if we have a client who fasts, loses weight, and improves markers of metabolic health, such as better insulin sensitivity...

Was it fasting per se that did it? Or was it losing weight? Being in a negative energy balance? A change in macronutrient intake — for instance eating less carbohydrates overall? Or were there other changes in eating habits that went along with the fasting protocol?

In practice, it's very hard to know.

Many responses to fasting and regular aerobic exercise are similar.

For instance, both fasting and regular aerobic exercise improve insulin sensitivity, produce more stress resistance in cells, and result in a lower resting blood pressure and heart rate along with a higher heart rate variability.

As one researcher noted, “Exercise and intermittent fasting slow aging and some age-related diseases by shared mechanisms involving improved cellular stress adaptation.”

So could we get the same results with a client by using aerobic exercise rather than intermittent fasting? It’s a useful question to ask.

In the case of intermittent fasting or energy restriction, which are often short-term interventions, it’s also hard to know whether any short-term effects that emerge will be the same as long-term effects.

For instance, the longer the duration of fasting or starvation, the worse our glucose control gets in the long-term.

Fasting for 1 day often improves our body’s handling of glucose. But, people who fasted totally for 3 days had significantly impaired glucose clearance afterwards.

And a long-term famine may eventually significantly damage our ability to appropriately manage our blood sugar.

The effects we see during fasting may not be the same as after fasting. For instance, during fasting, glucose, insulin, and a related hormone with anabolic effects known as IGF-1, or insulin-like growth factor 1, go down. In the short term, this is correlated with increased cell death (or, apoptosis), and autophagy (or, cellular cleanup), which helps “starve out” tumor growth.

However, immediately after fasting, these proliferation and growth factors go up. While this may theoretically offer some benefit to people trying to gain muscle mass, if cells are exposed to carcinogens, the increased anabolic, or tissue-building, environment may actually increase the chances of carcinogenesis, or tumor growth.

So what does this all mean for real clients in the real world?

First, it’s important to simply be sane and reasonable. Set realistic expectations with your client about what they are likely to experience as a result of intermittent fasting or energy restriction.

There is no “best diet”, and no one-size-fits-everyone plan.

Second, ensure success by fitting the plan to your client, rather than trying to make every client fit the same plan, and potentially not be able to either do what’s required, or not get the results they wanted.

Many factors can affect whether someone is a good fit for an intermittent fasting or energy-restriction-type plan.

Here are just some things to consider.

Sex differences — males are more likely than females to do better on an intermittent fasting-type plan. Women who are pregnant or nursing should definitely NOT pursue this.

Activity level — sedentary clients may do better, while highly active clients may do worse. Athletes during a training or competition season especially may not be a fit for a fasting-type protocol.

Body composition — people with a lot of body fat tend to do better, while people with a healthy average body fat less so — and people who are very lean need to approach this with extreme caution, as their energy, recovery, and hormonal reserves may already be relatively lower.

Since intermittent fasting or energy restriction is a stressor, it works better for people whose overall stress load is lower. Someone already under high stress should probably not add more.

It's important that a person have a balanced, objective, rational mindset — that they can easily review data, take feedback, and think about things logically. For someone who is already anxious, emotionally tied to food and eating, this may not be a good fit, and it's definitely not a good fit for someone with an existing disordered eating condition.

Any plan should fit easily into someone's lifestyle. If it causes problems, it's likely not a good match.

Some clients are more coachable than others — in other words, they're more open to feedback, guidance, and following the data. Clients who aren't strong in this area are probably not a good fit, as they'll be less likely to seek the support they need, or pay attention to the evidence that they receive.

And finally, goals are a factor. Intermittent fasting or energy restriction may be a better match for people who just want to be less sick — for instance, if they have a health issue that fasting has been shown to help with. Or, perhaps they have a lot of body fat and just want to lose weight or fat to get down to a healthy range.

Intermittent fasting or energy restriction may be less useful for someone who wants to be "better than average", although in some cases it MAY suit someone trying to get leaner than average if all the other factors are in place.

It definitely WON'T work for someone who needs and wants sustained athletic performance, especially at a high level, who wants to gain a fair bit of mass, and someone who thinks that IF will help them live forever.

Finally, if you and your client decide together that an intermittent fasting or intermittent energy-restriction-type plan is a fit, monitor their situation and all indicators closely.

If the plan is working well, you should hear things like:

"I feel good, consistently."

"I continue to have reliable, sustained energy without crashing."

"This is easy to do, and fits into my life."

"My hormones are normal."

"I'm performing and recovering well."

"I don't really think about food or eating that much. It's no big deal."

So, as a coach, ask yourself...

If you choose IF or IER for a client...

What type of plan might you experiment with?

For which clients is that type of plan a fit?

And why?

How can you monitor, support, and ensure a successful outcome for them?

In your Definitive Guide, we'll give you more suggestions about how to move forward, if an intermittent fasting or energy restriction type of plan seems appropriate.