



Episode 548: Ari Whitten on Eat for Energy: Beat Fatigue, Supercharge Mitochondria, and Unlock All-Day Energy

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Katie: Hello and welcome to "The Wellness Mama Podcast." I'm Katie from wellnessmama.com and wellnesse.com. That's wellnesse with an E on the end. And I am back today with one of my favorite people to talk to, Ari Whitten. And today we're talking about how to eat for energy, beat fatigue, supercharge your mitochondria, and unlock all-day energy. And as always with Ari, this is a very, very informative, fact-packed episode. He's so well-researched and so well-spoken. He's the founder of The Energy Blueprint, which is a comprehensive lifestyle and supplement program that has helped more than two million people and counting experience better health, better performance, and more energy. He's also the best-selling author of "The Ultimate Guide To Red Light Therapy," and the host of his own popular "The Energy Blueprint Podcast," which I have been on and enjoyed as well.

And in this episode, we go deep on things like real root causes of fatigue and what to understand if you ever feel fatigued. Why the real causes of fatigue are often overlooked. The research that led him to know more about this than essentially anyone else on the planet. Why the idea of adrenal fatigue fall short, and what to understand instead. How nutrition and circadian function are interlinked and how to optimize them. The way

body composition relates to energy. The real reason excess body fat causes problems by creating a pro-inflammatory response. Foods that are directly pro-inflammatory and better alternatives.

The real reasons we're seeing a rise in obesity and how we can reverse it. Some practical shifts that make a big difference in your body composition, we go deep on this one. Why it isn't about carbs and fat, and an important thing to understand instead. The importance of protein, understanding something called flux, and how this relates to fat loss. How to sync your central clock and the brain, and your peripheral clocks in your body for optimal energy, and so much more. As always, I learn so much from Ari, so much great information in this episode. I know that you will enjoy it as much as I enjoyed recording it. So let's join Ari. Ari, welcome back. You are a much-requested repeat guest. Thanks for being here.

Ari: Thanks so much for having me, my friend. Always a pleasure.

Katie: I love our conversations. And we're gonna get into the weeds with some really fun stuff today. But before we do, I have a note in my show notes that you're secretly into some woo stuff that you don't talk about as publicly online, so I hope it's okay to call you out a little bit, just because I've been on kind of my own journey with that the last couple years, and I'm so curious.

Ari: Yes, yeah. Absolutely. Well, I, you know, I have been for 20 years. It's just, it's something that is kind of, I separate it from the work that I do. For better and for worse. You know, there's an obvious positive side, and an obvious negative side to that. The positive side is that I have created a brand that is, you know, and me personally, I'm known, I've kind of established a reputation for being very science-based, being able to talk about, you know, a lot of research, and synthesize the research in novel ways, which is all beautiful, and it's helped me get the message out.

On the other hand, you know, there's elements that I am into and passionate about on a personal level, and things that have benefited me, that I don't talk about publicly, because they're a little bit woo-woo. They're a little bit esoteric, and they're a little bit out there. Now, I guess, to be, if I can just talk specifically, I would say that in my younger years, when I was in my early 20s and stuff, when I started exploring a lot of Eastern, spiritual kind of esoteric, meditative, yogic type traditions, I think, like a typical immature kid, I was very interested in, you know, sort of supernatural powers, and psychic abilities, and, you know, how I could use these kinds of things to further my egoic aims in life.

And, you know, now, things have really shifted for me. I'm still into a lot of that kind of esoteric stuff, but it's more about...it's not about supernatural powers, and, you know, all, like, kind of egoic-based desires. It's more about, you know, how can I use these tools to become a better father, and a better partner, and have more equanimity in my life, and more joy, and more presence. And, you know, those are kind of the goals now, but I'll mention...I don't wanna stay on this topic forever. I'm sure we could talk for a full hour just on this. But, you

know, some of my favorite authors...or I'll mention one guy, in particular, who's not well-known, but is really excellent. His name is Reginald Ray. And he's a scholar on Tibetan Buddhism. He's a professor at Naropa University in Colorado.

And he's written some really profound works, taking a lot of the Tibetan tantric Buddhism, and kind of stripping it of a lot of the cultural elements that are sort of meant for people of Tibetan culture, and making things accessible for a western audience, and kind of getting to the principles of what these practices are actually trying to achieve, and then translating them, you know, creating his own sort of guided meditations. And he's written a lot on somatic meditation, on embodied meditative practices, on opening the heart, and things of that nature. And I would highly recommend his work to anybody listening.

Katie: That's awesome. I agree with you. We could spend a whole hour just on that, and I've learned the last few years just how important that emotional-spiritual side can be. Like you, I love the scientific research and the data, and I'm learning there's very much, it's not an either-or. It's a both-and. I'll put links to that in the show notes. And I would guess most of our listeners are familiar with you because you've been on here several times now. But you are definitely the energy guy, and I've learned so much from you about this topic. And you have a new book out, called "Eat for Energy."

So, we're gonna go somewhat specific into some of these topics today that I think are really applicable to everybody listening. But to start really broad, I feel like, especially after the last couple of years, fatigue is a big topic, and many people are feeling fatigued and overwhelmed. And there's just, of course, been a lot going on. But let's start broad with what are some of the most common causes of fatigue?

Ari: Yeah. Well, if you look from a conventional medical perspective, generally, they talk about chronic fatigue as though it's this black box that we sort of know nothing about. And we don't really know what causes people to be chronically fatigued, and, you know, basically, their attitude is kind of, well, run blood tests, and, you know, maybe you'll come up with, you know, that person has anemia, or that person has diabetes, or they have hypothyroidism, or something diagnosable. And then you can treat that thing that you can diagnose as a disease. And if you don't test and discover something like that, then you don't really know what the hell's going on in that person.

And this is important because there's actual research talking about...specifically, there's a paper that's a compilation of research meant for conventional doctors for their treatment of people with chronic fatigue. So, it's a set of basically evidence-based guidelines. It's a synthesis of sort of everything they believe they know about the causes of fatigue and how to treat it. And basically, they have four recommendations for what to do if you're treating somebody with chronic fatigue. One is antidepressants. One is a recommendation to walk for half an hour a day. One is cognitive behavioral therapy, and one is, use stimulants as needed.

Now, you'll notice a few things. They don't even mention nutrition. They don't even mention sleep, or circadian rhythm, or gut health, or body composition, or so many other things that we could talk about, that there's vast amounts of research, linking with chronic fatigue. But they also talk about testing. And they say that, you know, unless there's some compelling reason to do any sort of specialized tests, like you suspect the person might have tuberculosis or something like that, then you run a standard blood panel for patients with chronic fatigue.

And they say, literally, in the paper, 95% of the time, there is nothing that comes back on those blood tests that is an explanatory factor in why that person has fatigue. Meaning, 5 out of 100 cases, they will identify something like I mentioned before. Maybe it's hypothyroidism or anemia or diabetes, or some diagnosable disease. But 95 out of 100 people with chronic fatigue, these people who are going to their doctor thinking, "This doctor knows everything about treating chronic fatigue, and they're gonna figure out my issues. And they're gonna use all this fancy technology and modern science and modern testing, and they're gonna identify what's going on in my unique biochemistry that's causing my fatigue." Well, 95 out of 100 people walk out of that office without any information about what is causing their fatigue.

So, that's conventional medicine. In alternative medicine, and functional medicine, and the natural health community, they were obsessed for a long time with the adrenal fatigue hypothesis, which, I think we've talked about in a previous episode, I've spent a lot of time debunking that. The short version of it is I've spent about a year of my life digging into the research on that. I don't mean to brag, but I probably know that research better than, I would imagine, everybody on the planet. Maybe there's one or two people out there somewhere that know more than I do.

But basically, the majority of that research essentially takes people with various kinds of chronic fatigue, stress-related exhaustion, chronic fatigue syndrome, burnout syndrome, clinical burnout, these kinds of disorders, and they compare them to normal, healthy people, of similar age and demographic, information, and lifestyle factors, smoking, exercise, things like that. And they look at their cortisol levels, and HPA axis function, hypothalamic-pituitary-adrenal axis function. They see if there's any difference. And the vast majority of those studies find no significant differences between people with those various fatigue syndromes and normal, healthy people.

So, that research, and forgive me, for anybody who's an advocate of adrenal fatigue for treating this very quickly, but I have several hours of lecture online for free, that if anybody wants to go into that subject in depth. But, the bottom line with that is, adrenal fatigue is not a compelling scientific explanation for why people are fatigued either. This notion that chronic stress wears out our adrenals, and then, you know, our HPA axis or our adrenals and our cortisol levels can't function properly, thus we end up with chronic fatigue. It's not compelling from a scientific perspective, and the evidence doesn't support it as a major cause of fatigue in those with fatigue.

So, what is? Well, the main things that are, you know, linked very strongly with chronic fatigue are things like circadian rhythm disruption, things like poor nutrition, things like chronic inflammation, things like poor gut health, being sedentary, lack of hormetic stress in your life. Poor brain health, blood sugar dysregulation, body composition issues, light deficiencies and toxicities, environmental toxicants. These are the main contributors and causes of chronic fatigue issues. And they cause this fatigue through a variety of different mechanisms that we can talk about.

But sort of on the big picture level, there is, just as there is a rise in obesity and diabetes in the last 50, 60 years, where these conditions are skyrocketing, heart disease, cancer, neurological diseases, fatigue is very much also an epidemic that has come into prominence during that same span of time, for all of the same reasons that we have epidemics of cancer and neurological disease and heart disease and obesity. So, it's really all of those same causes at the environmental and lifestyle level that are contributing to all of those conditions, including chronic fatigue.

Katie: Yeah, I think that's an important point, is that all of those things are actually symptomatic of what is actually going on. They're not the actual problem. But we're spending so much research, time, and energy focused on all of the different things that are still symptoms of what's actually going on. And, like you, I had an experience for a long time of learning to become my own primary health care provider, in a way, when I wasn't getting answers from conventional medicine, that I think that lesson was really important, that at the end of the day, we are each our own primary health care provider, because we're the ones choosing the inputs that go into our body on a daily basis, and I know you have a personal story of overcoming a lot of these things as well.

But the good news in that is that we do have control over the inputs going into our body every single day. And you mentioned some really important ones that I wanna go deeper on, meaning, like, food inputs, environmental inputs, light, and circadian rhythm. And we have past podcasts on some of these, so I'll make sure those are linked in the show notes. But let's just kind of go through each of those in order, and talk about nutrition first. What do we need to know about nutrition? Because I know there's a lot of misinformation going on on this topic in society, and I think some easy changes that people can make that'll make a big difference.

Ari: Yeah, absolutely. So, I'll give kind of a very brief, superficial overview, and then I'll let you decide which topic you wanna dig in. So, nutrition affects our energy levels in many, many different ways, through many different physiological mechanisms. One is circadian rhythm. So, obviously, circadian rhythm is very light-dependent. But there's also, it's basically, we have a central clock in the brain, and we have peripheral clocks throughout the body.

The central clock in the brain is primarily responsive to light inputs. The peripheral clocks throughout our body are primarily responsive to nutritional inputs. And what's important about this is, for optimal circadian rhythm

function, and all of the different factors that it affects, which is basically everything, we want to synchronize our central clock and peripheral clocks. So, I'll leave that one aside. We can talk more about that.

Body composition. So, chronic nutrient excess, chronic energy excess, will lead to the accumulation of excess body fat. And it can also, through poor nutrition, as well as lifestyle habits, you can get sarcopenia, loss of muscle mass. These are the two aspects of poor body composition. Too much fat, too little muscle. Both of those have profound effects on our energy levels, and these problems are widespread. Somewhere over 80% of people, of adults in the U.S., are dealing with either one or both of those things. And a huge percentage of them are what's called over-fat meaning carrying excess body fat.

Somewhat related to that is blood sugar levels. And we know that blood sugar levels, if you have insulin resistance, if you have hyperglycemia, or if you have hypoglycemia, if you're swinging between the two, and you have lots of big spikes, and then you're coming down, all of those things have profound direct and indirect relationships with your energy levels. They can affect your energy, affect your cravings, affect your hunger and food consumption, hormonal levels, affect your sleep quality. So, blood sugar dysregulation is a huge factor.

Nutrition obviously impacts our gut health, in a massive way. So, it's influencing literally the integrity of our gut, whether our gut is permeable, or healthy and intact. It's influencing the nature of that microbiome, whether we have dysbiosis or we have very high levels of beneficial bacteria, that are literally providing different energy substrates, short-chain fatty acids, as well as different vitamins and minerals to our cells and to our mitochondria, to produce energy.

So, gut health is obviously a huge factor. We know that gut health... There's a gut-brain axis, there's a gut-skin axis, a gut-lung axis. The gut is connected to everything. There is, of course, a gut-mitochondria axis. So, what goes on in the health of our gut directly influences the mitochondria, the cellular energy generators, throughout our whole body. And we also know, of course, that brain health is a factor as well. And there are various mechanisms in the brain that can contribute to fatigue as well. For example, something called sickness behavior. Sickness behavior is...it's an actual phrase that's used quite a bit in the literature to describe certain behaviors that occur when someone is sick, like they have a pathogen. But it also occurs in many other contexts, like if you've got a physical injury.

And basically, what's going on is that the brain is designed to respond in a way to high levels of inflammatory cytokines by creating fatigue, by suppressing energy levels, and altering neurotransmitters and hormones in a way that...and mitochondrial function and brain function, in a way that makes you kind of depressed, apathetic, low-energy. It makes you just kind of wanna lay there, so you don't have a lot of motivation to do anything. And this is actually an adaptive mechanism. It's not a mistake that we are built with this. Millions of years of evolution have wired this into us, because when you are sick with a pathogen, when you are injured physically...let's say you've damaged your leg. It is more adaptive, and you're more likely to recover your health if, during that phase of acute illness, or some kind of problem, you're resting, and you're conserving

energy and resources to allow those things to go to repairing the tissues, or fending off the pathogen, or whatever it is.

The problem is in the modern world, we have many different sources of chronic inflammation that are activating this mechanism in a maladaptive way. So, one is excess body fat, for example. Excess body fat itself is pro-inflammatory. It's creating chronic low-grade inflammation, which the brain is then sensing, and then responding to with some degree of sickness behavior. Except there is no pathogen to fight off, there is no injury to repair. It's actually just that you're carrying too much excess body fat, and that itself is creating low-grade inflammation chronically in the body.

Another example of this is poor nutrition, which also can directly lead to, there are certain foods that are directly pro-inflammatory, that can increase levels of inflammatory cytokines. They can also indirectly affect it via gut health. If you have a poor diet, and you start to get gut permeability and dysbiosis, well, now you've got undigested food particles leaking directly into the bloodstream, you've got bacteria, and something called LPS, lipopolysaccharide, or endotoxin, leaking into the bloodstream, and that is creating a highly inflammatory environment. And it's now sending your brain into this kind of sickness behavior, chronically. So, anyway, that's an overview of many of the sort of key factors that are, as far as how nutrition interplays with our physiology in a way that either contributes to high energy levels or fatigue.

Katie: That makes sense. And it's definitely, of course, well-talked-about, the kind of, rise in obesity in the U.S. and the rise of all these inflammatory conditions. And I would say probably most people don't want to carry excess body fat. Most people would want to have good muscle tone. What are some of the key levers that people can use to start optimizing here? Because I think it can feel overwhelming, and often, people don't know where to start.

Ari: Yeah. Great question. So, well, you know, I always...I'm a root cause guy. So, it's one thing to say, "Oh, well, here's a hack, and here's a hack, and you can do this and you can do that." But we need to first understand why. Why, in the last 50, 60 years, has there been an obesity epidemic, where the rates of overweight and obesity have gone from, you know, less than 10% of the population to now 80% of the population, in the United States, and most of the Western world is not far behind. And there are several key reasons. The number one reason is the adoption of a modern Western diet. A highly processed food diet, that is rich in refined sugars, refined starches, and processed oils, fats. And especially the combination of those things, in the context of processed or ultra-processed foods.

This relates to something called the food reward hypothesis of obesity. And basically, what is going on here is our brains... It's important to understand that evolution has wired us, like basically all other animal species, with a system that is designed to regulate our body fatness, appropriately, okay. So that the amount of energy we crave to eat is roughly equal to the amount that we're expending each day. And by doing that, we keep a steady body weight. We don't get too fat, we don't get too thin.

Now, the problem is, for most of evolution, we never had processed foods, and we never had sedentary lifestyles. And we never had so many of the other factors in the modern world that are contributing to fat gain. And so, that system was primarily designed to defend against famine and food shortage, not excessive food abundance. Okay, so there's a weak point in that system. And the modern lifestyle happens to be right in this weak point of the system.

Okay, so the food reward hypothesis of obesity, which is, you know, people might scoff at this word "hypothesis," and think, "Oh, it sounds like it's not proven." There are thousands of studies now proving this hypothesis, and it's not really debatable anymore. But basically, the way that it works is this system that we have that regulates body fatness is designed to work in the context of specific kinds of foods being eaten.

The problem is modern processed foods create a supernatural reward stimulus in the brain, okay, beyond what evolution designed us for. Meaning, it creates an unnaturally intense pleasure, in the pleasure center of the brain, that starts to do something quite profound. It changes our physiology from a state where it's operating in what's called homeostatic eating, where we're consuming an amount of food that's proportionate, roughly equal to the amount we're expending. And instead of homeostatic eating, it shifts us towards hedonic eating. And that means primarily eating for pleasure.

And when that happens, we become disconnected from all of these regulatory cues of these hormones that regulate our hunger and our metabolism and so on, and we start to change our relationship with food to one of pleasure and entertainment, instead of one that is designed to fuel our body and replenish the energy that we've burned off. So, the modern diet and lifestyle basically shifts us out of homeostatic eating towards hedonic eating. And it fundamentally does not work with this regulatory system that we have for maintaining our body fat.

What happens is, basically, to summarize all of this very simply, if you were to eat 500 calories of chicken breast and brown rice and broccoli, and something of, and some spinach, or if you were to eat 500 calories worth of donuts and cookies and pizza, you would have completely different hormonal responses and satiety responses to those different meals, even though they contain equal amounts of calories. So, the 500 calorie meal with the chicken and the broccoli, you're gonna feel, most people would feel, very full after that, and content to stop eating. Whereas the people in the processed food group are going to carry on eating, potentially hundreds of calories more per day.

And there are literally studies where they've tested this, where they've put people on equal calorie diets. Or they were intended to be equal calorie diets, and they're either eating whole foods or processed foods. And they show that when they're on whole foods diet, they naturally suppress their own eating, and ended up losing body fat, within a few weeks. When they're on the processed food diet, even though it's intended to be the exact same amount of calories, and the same macronutrient ratio, the same proportions of protein, fat,

carbs, people end up overeating. People end up consuming hundreds, 500 calories more per day, and they end up gaining weight.

So, even if you are intending to control it, you know, in a tightly-controlled experiment, people still end up consuming way more food in that context, and gaining weight. This is the fundamental driver of the obesity epidemic. It's the modern processed food diet, and how it basically overrides our body fat set point system that's designed to regulate our body fat, causing us to shift from homeostatic eating into hedonic eating, and for all those different mechanisms that regulate our satiety and hunger to not work properly, such that we end up overeating food, and putting on excess body fat. So that's fundamentally what's driving this.

There are other contributors, exposure to environmental toxicants, stress, circadian rhythm disruption, and sleep deprivation, how nutrition interacts with gut health. These are all other contributors to the obesity epidemic as well. But the main driver, by far, is this issue with the modern processed food diet creating too much reward in the brain, leading to chronic overconsumption of energy.

Katie: Yeah, I think that's a really important thing to unpack, because a lot of that got confused with the calories in, calories out, low-fat craze that happened over a series of decades. And I'm very much in alignment with you of just removing things like those processed seed and vegetable oils, and refined and processed sugars and carbs, makes a huge difference in how your body responds. And I've learned over the years, you know, our body's not a bank account. It's not as simple as just calories in, calories out. It's a chemistry lab, and we're sending hormonal signals with everything we eat.

And to echo what you said, I would challenge anyone to actually overeat on things like chicken breast and broccoli, or even, for me, like, ground beef and rice, it is very hard to overeat those things. And, in fact, now that I'm more conscious of maintaining enough nutrient density, and maintaining enough food, now that I'm working out so much, it's actually difficult to eat the amount of calories and protein I need in a given day, and I have to be very conscious about that. And it's so fascinating to see I'm eating now much more actual food than I used to eat, but the nutrient density is so drastically different, that I'm getting leaner while eating more, which seems like it's a crazy thing to grasp, but it's really fun to see firsthand.

And I know we've done podcasts in the past about light. I would encourage you guys, if you haven't listened to that one, go listen, because it's absolutely fascinating. But there's also an interplay happening here, you mentioned, with the circadian side, and with light and sleep, and how...because food is also an input in the circadian system, like you mentioned. And so, these things all have to work together. And unfortunately, sleep is another fall-down point for a lot of people in the Western world. So, what do we need to know about that side?

Ari: Yeah. Well, I feel like I didn't give many practical tools. I know you just alluded to a few. But do you wanna jump into a few practical tools on body composition before we go to circadian rhythm?

Katie: Absolutely. Let's do it.

Ari: Okay. So, number one, obviously, as an extension of everything I just explained, is eat whole food. Get rid of processed food. That's the number one most important thing that you can do to optimize your body composition, to lose fat, and also for health. That's the most important strategy for long-term health and disease avoidance. There isn't research showing that one particular macronutrient breakdown of the diet is superior to the rest. There are extremely...there's a ton of low-carb versus low-fat studies, and many of them are extremely well-done.

There's one study where they even did a 12-month study, with, like, 600 participants. And it was a randomized...it was an absolutely tightly, tightly controlled study, done over a very long period of time, low-carb versus low-fat, and is one of the few, if not the only study that also used whole foods, that emphasized getting rid of processed foods. So you had a low-fat versus low-carb diet, with equal amounts of protein, and that's emphasizing the exclusion of processed foods.

And after 12 months, there was no significant differences between the outcomes in the two groups. So, despite, you know, decades worth of attention being paid to carbs and fats as these sort of, like, "these are the things that are gonna determine your body fatness," the research just doesn't support it. Whole foods versus processed foods, there's a huge difference. Low-carb versus low-fat, there is not a huge difference in terms of outcomes.

Now, what macronutrient is linked with fat loss is protein. And there are many, many studies showing that between 0.8 to 1 gram per pound per day, per pound of body weight, per day, is strongly linked with long-term fat loss, with greater adherence to the weight loss diet, with increased resting metabolic rate, with increased satiety and decreased hunger, with increased energy levels. And all of those things I just mentioned are incredibly important, because it is the decline in metabolic rate, along with chronic hunger and low energy levels, that is the main driver of why people stop adhering to their weight loss diet and revert back to their old diet.

So, it's critically important when you're engaging in weight loss to do everything possible to maintain your metabolic rate, high, hang on to lean body mass, and that's what a higher protein intake does, and to increase satiety. That's also what protein does. And to help keep energy levels high. So, if you do those things, those are the keys to long-term success. Those are some of the biggest keys that differentiate, you know, the small minority of people who achieve long-term success versus the majority of people who revert back to old habits.

So, it's also important to understand most people are eating nowhere near this amount of protein. And when they actually start eating that amount of protein, they say exactly what you said a few minutes ago, where they go, "It's actually hard for me to eat this much food. Not only am I not starving, and, you know, feeling like I'm chronically depriving myself, but I'm actually feeling full, such that I don't even wanna finish what's on my plate, and I'm losing weight at the same time." Protein is the big key to that.

There's one other big key to that, which is, this is talked about in the volumetrics approach to eating, where they talk about sort of filling up at the beginning of your meal with lots and lots of vegetables, okay. And ideally, non-starchy vegetables, and water-rich fruits. And if you do that, you end up consuming far fewer calories in your meal than if you didn't do that. So this is another way to work with our biology instead of against it. Instead of just saying, you know, "I'm gonna starve myself and force myself to eat this few calories per day," which will work temporarily, but you're in a chronic, constant fight with your own biology, and eventually, your biology's gonna win, unless you're just one of the one in one million freaks with unbelievable willpower to override your physiology for months and months and months on end. But it's much better, it's much smarter, and you're likely to be much more successful, if you actually work with your biology, by using some of these methodologies, by using whole foods, by using high protein intake, by using the volumetrics approach, and consuming these plant foods at the beginning of the meal.

The last thing I'll mention here is flux. And flux is a concept that is really important, and the research shows is very powerful in helping people achieve fat loss, and yet, almost nobody talks about it, and nobody's heard of it. If you wanna understand flux, think of...just picture this. Picture a garden hose, with a trickle of water flowing into it and a trickle of water flowing out of it. And now, picture a fire hose, like on a fire truck. That's a big, thick hose, with tons of, you know, super high-force, pressurized water flowing into it and flowing out of it. Okay, both are hoses with water flowing in and out, but one has way more water flowing in and flowing out.

And this is what flux is. Flux is basically describing how much energy is flowing in and out of the system. So, on paper, if I say to you, you know, Scenario A is we've got a sedentary desk job worker, who normally burns 1,500 calories a day, and now she's gonna go on a diet, and she's gonna start eating 1,000 calories a day. Okay, so now she's got a deficit of 500 calories a day. Now, on the other hand, we can take some athlete, somebody who's extremely physically active, maybe they love running trails in the mountains or something like that. And they are burning 3,500 calories a day. And she wants to lose weight, and so she goes on a diet that's 3,000 calories a day, so she's got the same 500 calorie a day deficit.

Now, based on paper, based on that math, you would expect both of those people to lose body fat at the same exact rate. But that's not actually what happens. The person who has the higher flux state, even though they have the same caloric deficit, they maintain their resting metabolic rate higher during the fat loss, they hang on to lean body mass, they decrease satiety level, or, they increase satiety levels and decrease hunger levels. They have higher energy levels, they have more food flowing into the system, to allow for nutrient sufficiency. So they have all of this mix of factors that actually allows them to lose more fat, and to maintain lean body mass and resting metabolic rate, and avoid the dip, and fatigue, and the increase in hunger that

causes people to revert back to their old habit, and ultimately to achieve much greater long-term fat loss success.

So, high flux is a major key to that. And the way you do that is by starting with what I just described, starting by increasing your protein intake, and start by increasing your non-starchy vegetable intake at the beginning of meals. So, protein, non-starchy veggies, amp those up big time. And in accordance with that, then try to work on gentle movement, incorporating more gentle movement throughout the day, more walking, more moving of your body. Not high-intensity exercise necessarily, but more gentle movement throughout the day, and that's how you raise your flux, which is one of the big keys to long-term fat loss success.

Katie: And I'll say, from the personal experience side of this, when you actually start hitting those protein targets, your energy goes up so drastically that working out gets much easier because you actually want to, and it's much harder to willpower yourself into movement when you're in that fatigue state, whereas now, I'm excited to go work out, because I have so much energy. And I realized when I started tracking, even thinking I was being very health-conscious, I was drastically undereating protein, and getting to that target range of, for me, 130 to 150 grams protein per day, it takes, actually, effort.

And I will say, as a practical side, one thing I found that helps me a lot, if anybody's new to this, is I wake up when the sun comes up, and then I don't eat for about the first hour. I hydrate. I drink a lot of water that first hour, and get some time outside in the sun, which we'll probably touch on a little bit. But then, I try to make sure I get protein at breakfast, protein at lunch, and I try to stop eating by the time the sun goes down, or even by about 5 p.m., to give myself a lot of rest time before sleeping, so that my body can digest all of that protein before I'm sleeping. And when I adhere to that, my energy's incredible, my sleep is really good, and I'm building muscle faster than I've ever built it before. I just, for context, last week, split squat 345, which is well over 2X body weight for me. So, it definitely works, for any of you questioning. I know the science is there, but from firsthand experience, it's really drastic, and incredible to watch.

Ari: You did a split squat with 345 pounds?

Katie: Mm-hmm.

Ari: Jeez, you're an animal, Katie.

Katie: I had this story my whole life of not being an athlete, and I had a podcast guest say, "No, lower body, women are just as strong pound for pound as men." And so, it was like a switch flipped, and I was like, "Oh. Okay, well, then I'll just lift like the guys." And turns out it works.

Ari: Awesome.

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So, and I know, like, I touched on the morning sunlight thing, which is a thing I originally learned from you, and now I am very, very consistent with, because I notice the difference so much. But light and sleep obviously are huge levers in this equation as well, and I feel like underused ones, certainly. Like, nobody is questioning that we need to get good sleep, however, many of us are just not actually getting enough, or enough quality sleep, and, I would argue, not getting enough, or enough quality light as well.

Ari: Yes. Yeah. One hundred percent. So, we have basically this circadian rhythm. It's basically a 24-hour biological clock built into our brains, and where we have this central clock, okay. And the central clock regulates and impacts many, many different neurotransmitters and hormones that affect our sleep-wake cycles. So, just consider the fact that every night, through no volition of your own, you enter an entirely different state of consciousness for eight hours. This is all being controlled by this biological clock in your brain. And, again, the next morning, you wake up, again, through no volition of your own, and you enter into a new awake state of consciousness.

Okay, all of that's controlled by this circadian clock, and it's affecting many different neurotransmitters and hormones. There are hormones, many important hormones, that are tied directly into the circadian clock. Things like thyroid hormone, testosterone, melatonin, cortisol, growth hormone, these are all intimately linked with the circadian rhythm. And if your circadian rhythm is non-optimal, which most people's is, living in the modern world, then all of those hormones, and many other neurotransmitters that are affecting energy and mood and sleep, are also not optimal.

So, that's the central clock. We also have these peripheral clocks throughout all the tissues of our body. And a lot of this is really new discovery. You know, it's really in the last 10, 20 years that scientists have discovered, "Oh, my, gosh. We have these clocks and clock genes that are in our skin, and in our eyes, and in our liver, and in our intestines, in our stomach, and in our muscles," and every conceivable tissue of our body and organ and gland of our body has these peripheral clocks.

Now, the goal of what we wanna do to optimize circadian rhythm is to synchronize the two, to synchronize the central clock in the brain with all the peripheral clocks in the tissues. The central clock in the brain, as both of us mentioned earlier, is linked primarily to light. Also, other factors affect it. Nutrition affects it, to some degree. And some other factors like movement, as well as temperature, actually, affects that central clock in the brain.

And then, the peripheral clocks throughout the body... So, actually, let me just talk briefly on the central clock. So, to optimize that central clock, one of the biggest factors that we need to do is get ample light exposure during the day, ideally, outdoor sunlight. We need to get it, ideally, within the first half an hour of waking up. Getting that light signal strongly in the eyes, very, very important. Those light photons enter the eyes, feed back through nerves directly into that circadian clock, and basically communicate, "It's daytime, the time to be awake, alert, active, and energetic."

But if you wake up and you're in a dark indoor space, under house lighting, looking at cell phones, and then, at nighttime, you're also doing that same thing, you're in an indoor environment, in house lighting, looking at computer screens and cell phones and TVs, you don't have a big differential between the light that you're getting during the daytime and the light that you're getting at nighttime. And that results in basically that central clock in the brain not getting the proper signals that it needs to know the difference between daytime and nighttime.

So, what we want is lots and lots of bright light during the day, ideally outdoor light, which is 100 to 1,000-fold greater intensity than indoor light, and we want it within the first half an hour of the day. And, after the sun goes down, we want to minimize any blue light. That's the primary color of light photons that affects that circadian clock. We wanna minimize the amount of blue light entering our eyes. So, we do that by optimizing the lighting in our homes, ideally shifting more to incandescents and halogens, as opposed to LEDs and

fluorescents, and minimizing blue light exposure from screens. So, computers and cell phones and things like that. There are various apps you can download, can get blue-blocking glasses, and so on.

So, that's a very brief version of how to optimize the central clock. The peripheral clocks are primarily responsive to food. And we wanna synchronize the two. So, we're optimizing our central clock with light, we're optimizing our peripheral clocks with food. The way we do that is four key strategies. One is time-restricted eating. And it turns out, research has found that about 85% of Americans consume...their feeding window, or eating window, is between 13 to 16 hours long, okay. What's optimal is 6 to 10 hours. So, most people, almost 9 out of 10, are eating hours longer, from their first bite of food to their last bite of food, they're eating hours longer during the day than they should be. This is the nutritional equivalent to getting lots and lots of artificial light in your eyes after the sun goes down. In that way, your central clock is basically getting these daytime signals way into the night, after you shouldn't be getting that blue light anymore.

The same is true with food. Once the sun goes down, you shouldn't be having lots of food be poured into your system. And so, that feeding window, or eating window, should be confined to a narrower time during the day. And that one thing, by itself, can make a massive difference. We have research showing that when people engage this strategy of time-restricted eating, even if they don't do any changes to what they're eating or how much they're eating, they just change when they're eating, which time period during the day, we see decreased oxidative stress, decreased inflammatory biomarkers, improved sleep quality, increased energy levels, and across the board improved metabolic health. Improved insulin sensitivity, for example. So, everything improves just through that one strategy.

The one caveat that I wanna mention here is don't go too fast. Don't think, you know, if you're at a 16-hour window now, don't think, "Well, I'm just gonna cut it to six hours." Because the problem is, if you've been in a long feeding window, your body doesn't have the metabolic flexibility yet to do that, to go for long periods without food, so you need to ease into it much more slowly. You know, go to a 13-hour window for a week or two, then a 12-hour for a week or two, then a 10-hour for a week or two, and so on.

And, also, the one other nuance here is shorter is not always better. So, I actually personally eat closer to a 10-hour time-restricted eating window, because I'm someone who's, I'm already lean. I'm extremely physically active. I do hours of exercise every day, between surfing and weight training, and martial arts and things like that, and hiking with my dogs. So, for me, to get the nutrients I need, it's more optimal for me to be closer to 10 hours. If somebody is overweight and not very physically active, it's gonna be more optimal for them to move towards the six-hour end of the window.

Another aspect, which you alluded to, Katie, that you've been doing, is syncing that feeding window with the hours of daylight as much as possible. Meaning, not consuming lots of food after the sun goes down. We know that in animal experiments, when they take animals and they give them food during the time period...if they only allow them food during the time period that they're supposed to be inactive and resting and asleep, they will generate all kinds of metabolic dysfunction. They'll become obese and insulin resistant, and have high

inflammatory biomarkers, and high oxidative stress, and they'll suffer widespread negative metabolic effects. And that's compared to eating the exact same amount of calories, of the exact same type of food, just when they're supposed to eat, during the time period of the day that they're supposed to be active, instead of the time period that they're supposed to be asleep.

So, that's one other aspect of it. We know also that if you give someone the same meal, the same exact meal, at 8 a.m. versus 8 p.m., the meal that you have at 8 p.m. will cause a 29% increase in peak glucose, an 86% increase in total glucose response, and a 66% more time spent in hyperglycemia, than eating the exact same meal at 8 a.m. So, there are fundamentally different hormonal responses and metabolic responses in terms of our ability to process these nutrients when we consume food at the biologically appropriate times of day.

Now, we also know that there are studies that compare what's called early time-restricted eating to late time-restricted eating, where you consume the majority of...you shift your eating window towards the morning hours. So, let's say 7 a.m. Let's say you've got an eight-hour feeding window, from 7 a.m. to 3 p.m., just as an example. Versus the same eight-hour feeding window, but from noon to 8 p.m., or 1 p.m. to 9 p.m. We see consistently that the people who do early time-restricted eating lose more body fat, have more energy, have better sleep, have better metabolic parameters across the board, lower oxidative stress, better insulin sensitivity, and so on.

We also know, related to something called calorie stacking, even within this window of time, where you put the bulk of your calories that you're consuming during the day also matters. So, if you compare two groups of people, one is consuming most of their calories with breakfast and lunch, and a small dinner, and the other group is consuming a small breakfast and lunch and a big dinner, the group that ate most of their calories during the first part of the day, during the early part of the day, ends up losing more weight, even at the same amount of calories being consumed.

So, these are different ways. Basically what's going on is these are strategies that we can use to optimize our peripheral clocks, and sync our peripheral clocks to our central clock. And when we do that, we get rewarded with all kinds of benefits and boons, as far as metabolic health and energy levels and sleep quality, and so much more.

Katie: Yeah, that hormonal signaling is such an important piece. I recently got to talk to Dr. Satchin Panda as well, and he echoed exactly what you said. He's probably the foremost expert on this in the country, with the circadian side and time-restricted feeding. And he said the same thing. Eat in that restricted window, that's more focused on early in the day, and that by doing that, like you said, we can actually eat plenty of food, not feel hungry, not feel deprived, and have better sleep and better energy during the day.

And as always, with you, time goes by so quickly, but I wanna make sure we also get to touch on if there are any particularly supportive foods or supplements that can help, especially if someone is overcoming some of these issues, and they are in this state of fatigue, or they are making these big shifts into eating in a more restricted window, getting more sunlight, getting more movement, anything that can help along that path?

Ari: Yeah, I'll mention a few things. So, first of all, a multivitamin and multimineral supplement, high-quality one, with, you know, methylated forms of B vitamins, good, quality stuff, not just a junky multivitamin like you find anywhere, has been shown in studies with people with chronic fatigue syndrome, in the span of just two months, to improve sleep quality by 39%, and improve energy levels by 32%, just by being sufficient in various vitamins and minerals. And this is critically important, and it's often overlooked, because... It's so important, because most diets...most people are deficient in at least one, if not more like four, five, six or more, of the essential vitamins and minerals that our body needs to function.

And, I mean, it's just extraordinarily common. Almost nobody is sufficient in all of these things. So, it's such an easy thing to add, especially if you're suffering from chronic fatigue. Get yourself a premium, multivitamin, multi-mineral formula. I make one. I consider the best on the market, but there's several other good ones on the market as well. And that can make a huge difference for people with chronic fatigue.

Another great compound is called NT Factor. It's a phospholipid formula, extracted from phospholipids from soy, but it doesn't have any soy compounds. It's taking...if anybody's worried about soy. It's taking just the phospholipids out of this, from soy lecithin, and extracting them, and they add lots of other things to it that help it avoid being broken down in digestive processes. But these phospholipids actually end up traveling through our blood, into our cells, into our mitochondria, where they help repair damaged membrane phospholipids of our mitochondria.

There's a wonderful paper about this, from a researcher named Garth Nicolson. It's called "Lipid Replacement Therapy." And they've done experiments with...they've done studies with NT factors in many different studies, with many different kinds of chronic fatigue, from aging-associated chronic fatigue to obesity-caused fatigue, to Gulf War illness, to chronic fatigue syndrome, and many other types. And they've shown consistently 30%, 40%, 50% increases in energy levels in just four to 12 weeks of using just this one supplement that helps repair mitochondrial membranes.

Another one that I'll mention is rhodiola rosea. And they've done experiments with this adaptogenic herb in the context of people with burnout syndrome, clinical burnout, various kinds of stress-related chronic fatigue, showing literally, within four to eight weeks, you can cut a person's fatigue in half, just from that one compound. Another way of saying that is you double their energy levels, just through that one compound.

One other one I'll mention here is acetyl-L-carnitine. And actually, maybe I'll mention a couple more. Acetyl-L-carnitine has been shown, in older adults with chronic fatigue, to...actually, this is a compound that helps the mitochondria bring in fatty acids to burn for energy. So, that's kind of the mechanism of how it works. Also works in a few other different ways to improve metabolic health. But in studies in older adults with chronic fatigue, they've shown 50% to 60% increases in both mental fatigue and physical fatigue, in the span of three months.

So, let's see. If anybody's struggling with mood issues, depression, there's a wonderful thing that's very seldom talked about, but is very powerful, and that's saffron. There's research on saffron, on the herb saffron. It's actually the...I forget the proper word. Pistil or stamen or something like that, from a particular type of flower, often grows in the Middle East. And it's been a prized herb or spice for centuries, for millennia. And there's research showing that it works as an SSRI in the brain, and that it has efficacy on par with antidepressant drugs, but without the side effects. Just taking saffron can be a powerful thing for people struggling with depression, and that's a very common thing among those with chronic fatigue.

Katie: I love it. I took lots of notes. Those will all be in the show notes at wellnessmama.fm, for anybody listening on the go. And I know there's, as always, so much more we can cover that we can't fit into a one-hour episode, but you have a book that goes into detail on all of these different topics, and gives a lot more, even more detailed recommendations. So I highly encourage you guys to check that out, along with our past podcast episodes. And, as always, I say this with you. I hope we will do another round sometime soon, because there's so much more to talk about. But, lastly, for today, if there is a book or number of books that have profoundly impacted your life, I'd love to know what they are and why.

Ari: So many. Well, since this is Wellness Mama, I'll mention one of the most recent ones that hugely impacted my life. It's a book by Gabor Maté and a neuroscientist or a psychologist. I think his name is Barry Neufeld or something like that. And it's called "Hold On to Your Kids." And I'll tell you, I don't think I've ever read a book in my life where almost every page that I flipped, I went, "oh, my god. I cannot believe how wrong I was in all of my assumptions about this."

You know, and it's related to raising kids, and it's related to education, and it's related to the parental bond with kids, and the peer bonds that they form, and the dynamic between the two, this sort of, to some extent, the battle, in some cases, between the two, between the parental bond with the kid and the peer bonds with the kids.

And it really just completely rocked my world, as far as all of these assumptions that I had made about child-rearing and what's best for children and what kids need, you know. And it made me realize the importance of my connection with my kids, and that the most important thing for them to grow up healthy and happy is actually their time with me and their mom, and us cultivating that bond every day. And that's number one. You know, I used to think, well, you know, "I need to put my kids in school. They need to learn independence from me. And they need to, you know, be around other kids all day, because they need to be socialized."

And, you know, and I had all these kinds of assumptions, that are widespread in our culture. These are normal assumptions, especially in the modern U.S. And it just dismantled sort of everything that I thought I knew. Again, I've never read a book that made me go, "Wow, I cannot believe how wrong I was." And just, every two pages, I was saying that to myself. So, if somebody has children, and they have not read that book, I would highly recommend it.

Katie: I love it. That's a new recommendation. And I just ordered it as well, and excited to hear it. And thank you as always, Ari, for your time. You're such a wealth of knowledge. I really value your research, and I'm so grateful you're here today.

Ari: Thank you so much, my friend. It's always a pleasure connecting with you. One last thing I wanna mention, for anybody who goes and buys the book, you can buy it on Amazon or Barnes & Noble or whatever, we're giving away two free courses, normally \$200 courses. We're gonna give those away to you as a thank-you for buying the book. So, you can just email us the receipt @ari, A-R-I, at theenergyblueprint.com. And then we'll gift you those nice free gifts as a thank-you for buying the book.

Katie: That's awesome. Thank you for doing that, and thank you again for your time. And as always, thanks to all of you for listening and sharing your most valuable resources, your time, your energy, and your attention with us today. We're both so grateful that you did, and I hope that you will join me again on the next episode of "The Wellness Mama Podcast."

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