

## Optimal Diet For Good Brain Health

**Jason Prall**

with **David Jockers, DNM, DC, MS**



### Jason Prall

Thanks for tuning into the reverse brain disorder summit and joining me now is my good friend, Dr. David Jockers who is a doctor of natural medicine and runs one of the most popular natural health websites in drjockers.com, which has gotten over one million monthly visitors. His work has been seen on the popular media such as the Dr. Oz show as well as Hallmark Home and family. Dr. Jockers is the author of the bestselling book, the keto metabolic breakthrough and the fasting transformation. He's a world renowned expert in the area of ketosis, fasting, inflammation and functional nutrition and he's the host of the popular doctor jockers, functional nutrition podcast. Dr. Jockers lives in Canton Georgia with his wife Angel and his twin boys, David and Joshua and his daughters Joyful and Shine. Welcome David. Good to see you.

### David Jockers, DNM, DC, MS

Yeah, absolutely. Jason, thanks so much. Always. Great to connect with you.

### Jason Prall

Yeah, well this is a, this is a topic I know you have a lot of familiarity with your work in this sort of fasting, intermittent fasting, ketosis world and there's a lot of that that is tied into brain health, right? And I think in the last few decades in particular were really recognizing sort of this brain guy, gut brain bidirectional relationship and how much our food choices. and perhaps even the absence of making choices with food can impact brain health. So maybe just start me off on, on that level. Like what is it about this brain gut relationship that seems to have such a profound benefit, why do we want to focus on our food so much?

### David Jockers, DNM, DC, MS

Yeah, for sure. Well, you know, for all of us, the quality of our life is going to come down to how healthy our brain is and that's really what gives us energy, mental clarity, drive in life, passion in life, the ability to feel pleasure, the ability to stay focused to not be so distractible. You know, so



many people on our side today are just incredibly distracted. So the ability to focus and get things done and to feel good about ourselves and so we really need to prioritize good brain health and you're right, there's such an intimate connection between the gut and the brain. In fact there is a nerve cranial nerve 10, it's called the vagus nerve. Vagus is actually latin for wanderer. So it comes from the brain, The brain stem, which is the lower part of the brain travels all the way down into our heart lungs and then down into our digestive track. And the vagus nerve is the major branch of our parasympathetic nervous system. So we think about two parts of our autonomic nervous system. So our nervous system we have I'm gonna break this down into the autonomic and somatic nervous system. The somatic is the part that we control. Like if I want to move my hand. You know, I have to kind of think that thought move my hand. That's a somatic nervous system? Autonomic is basically what it sounds like automatic, right? We don't have to think about our heart beating.

We don't have to think about digesting our meal. Our body just does it? Our body produces a stomach acid, the enzymes, you know, and it goes to work starting to digest food. So there's these two branches and within the autonomic branch we have a sympathetic nervous system and our parasympathetic, sympathetic is our fight or flight. Parasympathetic is our rest digest. And he'll branch of our nervous system. And so the vagus nerve is really the main it's kind of the main conduit of that parasympathetic part of our nervous system. So it runs down into the gut, it's what stimulates the production of stomach acid of bile of pancreatic enzymes. And it should be in this kind of organized, simple uh symphony almost. You know, like we're basically produce just the right amount of stomach acid, stomach acid comes down into the uh into the small intestine, triggers certain receptors that now allow bile to flow out and allow pancreatic enzymes and bicarbonate to come out to help neutralize and alkali eyes, the bolus or the digested food that's now in the small intestine.

And we should have kind of this very good organization that takes place with this and the vagus nerve really drives that. So the brain is constantly the brain and body are constantly communicating in that way. We also know that the gut, they call it the second brain right? And one of the reasons why is we have tons of neurotransmitters that help regulate activity in the gut. We have serotonin melatonin which you know we think about as our sleep hormone melatonin plays a really key role in helping regulate activity in the gut as well. We produce dopamine, we produce a lot of different key neurotransmitters that we also produce in our brain right there in the gut. And then also the bacteria or our microbiome are producing nutrients that help communicate with the brain or help support brain function.

And there's also endotoxins, there's toxins that are produced by gut bacteria, pathogenic bacteria parasites. Candida for example. Candida produces something called aflatoxin and settle out to hide. Said allowed to hide is basically like a form of alcohol that actually will damage the brain. Glial toxin as well. Very very toxic for the brain. So having a healthy microbiome and a healthy well functioning vagus nerve activity is extremely important for that gut brain kind of bidirectional activity. And when we have a disorder in our gut we're going to end up with more brain inflammation and what are the symptoms of brain inflammation, things like depression, mood disorders. Brain fog, trouble processing, right, slower processing distractibility, 80 HD trouble sleeping, okay. And then a long term obviously this can turn into things like mild cognitive decline and eventually into dementia. Alzheimer's Parkinson's a lot of links between got this bio Cicely Got syndrome and Parkinson's and ALS. Right, all these different types of neurodegenerative types of conditions.

### **Jason Prall**

Yeah, this is I mean you're painting a huge picture for us, right? I mean this is really, really key and I think as much as we've started to understand some of these mechanisms over the past few decades, there's undoubtedly a lot more that we can learn, right? I mean there's there's just so much that we still have yet to discover but when it comes to brain I think it's it's it's really important that we've now kind of recognized certainly in the integrative and functional medicine world and I think even in the sort of more conventional worlds that it's not just about the brain itself, right, There's other aspects to brain dysfunction, whether it be heavy metals, whether it be infections, whether it be metabolic dysfunctions in particular. Right, And that's really what I want to get into with you, but dysfunctions throughout the body that can really start to impact the brain and and vice versa. Right.

So this is the catch 22 is that peripheral dysfunctions can impact the brain in such a way that the now the brain's dis functioning or caught in this dysfunctional loop that's now impacting other places in the body and other aspects and systems. Right? So and eventually we get to the point of disease sort of labeling and diagnoses and now we've got to unwind this kind of mess that we found ourselves in. And I find I think probably why you kind of are the primary expert in this realm, metabolic dysfunctions and metabolic function in general is a key aspect to well, really all disease and all healthy function. But let's start there because you know, blood sugar regulation, I mean, sounds so fundamental. Sounds so basic. You know, unless you have insulin resistance or diabetes or perhaps cardio metabolic issues that you know about, you might not even be paying attention to blood sugar regulation, right? This is not something that most people are going to monitor on a regular basis unless they have a reason to or unless they've found this educational

piece and said, oh my gosh, I have no clue what my blood sugar regulation is. Let me find out but talk to me about blood sugar regulation how it's impacting brain health in general. For sure.

### **David Jockers, DNM, DC, MS**

Well, when you think about the brain and we think about individual neurons, I really need three key things to be able to live and thrive and that is they need oxygen. They need activation. So actually movement itself is a key nutrient for neurons and then they need some sort of fuel source and that can be glucose or it could be ketones. So the neuron can't run 100% on ketones. But they can get, you know, roughly close to about 50% of their energy off of ketones and I'll break down what the ketone is here shortly. But you know for most of us we were taught especially taught throughout school that they really need glucose right in order to produce energy. And so we've got to keep our blood sugar stable and we also need to make sure that our body is very insulin sensitive. Insulin is this hormone that our body produces in order to get glucose out of the blood streaming into the cells.

This is really important because when we eat you know a large amount of carbohydrates or sugar or something like that, our blood sugar goes up and that's no sugar molecules. Once you get up over a certain threshold, sugar molecules will actually bind to proteins and they'll create something called advanced glycation end products or A. G. E. S. These are GSR sticky proteins that drive up oxidative stress and they're very damaging to different tissues of the body, like the endothelial lining of the blood vessels. So they create damage and that's really one of the major insults that ends up causing plaque and eventually some sort of cardiovascular disease or cerebrovascular disease where somebody ends up with a stroke has to do with this high amount of A. G. E. S. So insulin comes out, insulin is like a superhero hormone. Its job is to get the glucose out of the bloodstream and into the cells where we can now use it to produce energy.

And it's very very important in the brain, we need that insulin, we need good sensitivity from the receptors. And so what happens is when we're eating the right amount of sugar, the right amount of fats proteins and we're staying active and living a healthy lifestyle ourselves become very sensitive to insulin. So we produce the insulin, it grabs the glucose and like a key going into a door unlocks the door, allows the glucose to go in where now it can be used to produce cellular energy and all is well, right? However, when we start consuming too much sugar, not moving our body enough. Okay, that's a big factor. Maybe we're under a lot of stress on sleeping well, maybe we have, you know, high level of toxicity. All of these factors can cause blood sugar imbalances. Where now our sugar goes way up, we produce insulin and we have to produce more and more and more insulin in order to get the sugar out of the bloodstream right? And over time ourselves start to not respond well to it. And uh from that we can develop insulin



resistance. Now some individuals will actually get a condition called reactive hypoglycemia as well. Where And this is so when we think about blood sugar regulation, we want just the right amount of sugar in our bloodstream if we have too much sugar and too much insulin, that is a big problem. If we have too little sugar and perhaps either too much or too little insulin, like in the case of somebody with type one diabetes, uh they may, you know, shoot insulin in and that drags their blood sugar down, but then they're not producing insulin. However, so we need the right amount of insulin, we need the right amount of sugar when the sugar comes down to low and we're hypoglycemic. Now, we don't have enough fuel for those neurons and the neurons start to die and we get neuro excited toxicity where when one neuron dies because it starves to death, it actually dies in the releases, it spills out all these different neurochemicals that now damage almost like infecting and they damage and overload the neurons around them and cause them to have an exciting toxic reaction. And so this kind of spreads in different regions of the brain.

So it's really important that we're protecting these neurons with proper blood sugar stabilization in the way that people will know if they have healthy blood sugar is first off when you eat your meal, you should feel very, very stable and you should feel very mentally clear for at least 45 hours after you consume your meal. If you're noticing that you have a lot of cravings if you're feeling irritable. If you're feeling dizzy, lightheaded, maybe you have a headache a few hours after your meal, that is a sign that most likely your blood sugar has dropped too low and you're having this sort of hypoglycemic reaction. And in these individuals they eat a meal and then their body puts out way too much insulin, they still have a level of insulin sensitivity to where the insulin interacts with the cell, it brings the sugar into the cell, but it brings too much sugar into the cell and now your blood sugar is low and so after the sugar is used as an energy source. Now there's not a whole lot left. And so a few hours after that meal now your blood sugar's down and now the neurons are starving, they need more fuel and they're not getting enough of it.

Sugar is like a quick energy source. So we need a continual, continual supply of it. We need a lot more on a regular basis and in a shorter interval, then we do it, We're burning fat or ketones as an energy source. And I'll go into that here shortly. But when we're looking at blood sugar dynamics, it's so important that we're keeping that stable. So hypoglycemia is a big problem. And then another big problem is high blood sugar or hyperglycemia and insulin resistance and the way that, you know that your hyper glycemc or if you have insulin resistance is you eat a meal and this, this isn't 100% but it's very common with people that have insulin resistance, they eat, they eat a meal and then they still crave sugar right after the meal. So they eat a big meal, they eat a lot of food, plenty of food. Yet they're still craving sugar and then they'll eat something that has sugar in it and yet they're still craving it. And the reason why is their bodies having so





much trouble actually getting the sugar into the neurons. And so the brain itself thinks we're deprived, we don't have enough sugar, we don't have enough energy, we need to consume more. So we're having cravings to try to drive the individual to eat the sugary, carbohydrate rich food. However, we're still, even though the blood sugar is elevated, were not actually able to clear it and get it into the neurons where they can be used for energy. So if you notice that that's most likely related to insulin resistance and then also when you eat your meal, you're just really fatigued right afterwards. It's almost like you need to take a nap. Like you just didn't feel like you got the energy push that you should have gotten from from the food that you that you eat. And so you're craving food and then also you're you're really, really tired. Now, another telltale sign is if you have abdominal obesity right? So if you look down and you can't see your feet, right? So for a woman, obviously they may have breast but you know, kinda push your breast aside. If you look down, you can't see your feet because your belly's hanging over. That's a sign of insulin resistance, that extra abdominal fat is a classic sign.

Also for women, oftentimes they'll develop conditions like PCOS polycystic ovarian syndrome as well as cystic acne. If you're noticing just kind of chronic acne, that's a sign of insulin resistance. If you've got polycystic ovarian syndrome for men, oftentimes they develop low testosterone, they've got the belly fat sometimes will even develop some breast tissue because when you have high insulin, when you have insulin resistance, you actually activate this hormone called aroma taste, which takes testosterone and converts it into estrogen. So, these are males that have lower testosterone, higher levels of estrogen and they start to develop a little bit of breast tissue as well as the abdominal obesity. So, these are kind of classic signs that you may have insulin resistance. And if that's the case your brain is really suffering, it's not getting the fuel that it needs on a consistent basis. And it's something that we really need to look at in more detail, right?

### **Jason Prall**

And you're talking about these conditions that over the long haul can really set up pretty severe brain disorders and degeneration later in life, right? I mean, that's the thing is that there's no there's no discontinuation here. You know, this is a continuum that if not resolved over the course of years, can really create some damage down the line. And you mentioned, you know, when it comes to blood sugar, obviously, I think that the obvious thing to focus on here is the food choices that we're making, right, This is this is a big one, but before we get into that, I want to get to the less obvious one maybe, which is when to eat, how much to eat and not eating right, and then we can get into kind of what to eat. But to me, this is one of the bigger areas that I find no matter who it is and no matter to some degree, no matter what you're eating. Perhaps the most impactful thing you can do is to change when you're eating and how much you're eating and that can really, really make a difference. I've noticed some people that don't

particularly eat a great diet and I wouldn't advocate for that. And yet they do some intermittent fasting and they're eating, they're eating schedule is really, really good and they're staying relatively healthy. Their blood markers look good, like it's really, really wild what can happen when you, when you keep your portion control and your eating schedule on point. So maybe talk to me about that and what's really going on there.

### David Jockers, DNM, DC, MS

Yeah, this is very, very important when we think about the neurons again. I said that they can create energy from glucose as well as ketones. And so ketones are this water soluble byproduct of fat metabolism. So fatty acids, most of the cells of our body can use fat as an energy source. And it's really a potent, great energy source. We can produce more cellular ATP, which is our cellular energy and we produce it with less reactive oxygen species being produced as a metabolic byproduct. So it's more of a cleaner fuel source. However, fatty acids are too big to get across the blood brain barrier. So what our body does is it actually takes fatty acids and converts them in the liver into a smaller, water soluble molecule called a ketone. And that ketone then travels in the bloodstream up into the brain crosses the blood brain barrier, where it has a really powerful effect on the brain tissue on the neurons. Not only can they use it as an energy source, but also just the presence of ketones beyond a certain threshold point, which, when we look at it on blood tends to be about 0.5 million mol.

Uh if you're testing like your blood ketones just hitting that threshold and going above that threshold actually turns off inflammation in the brain. So it provides fuel for the brain turns off inflammation. We have something called the neuro inflammatory foam, which is kind of this inflammation amplifying pathway in the brain that turns up all immune activity and all inflammation in the brain, it's kind of the way the brain is, has been designed to help prevent against infection from killing it quickly. The problem is when we have blood sugar imbalances, when we're exposed to a lot of toxins, when we have different infections in our body, we turn that up right. And for most people when they're not taking good care of themselves, right? Again, if you go out in the street and you see somebody with, you know, a big belly, right, that person's brain is degenerating, right? It's inflamed and degenerated. So we need to turn off that inflammation process. The presence of ketones in the brain actually does that to epigenetic modulator where it turns off that inflammation. On top of that, it actually turns up the production of Mitochondria. We know that the brain outside of the reproductive organs, the testes and ovaries is the most dense area, the neurons in the most dense area from Mitochondria. Mitochondria produce all the energy in our body. And the brain itself consumes a tremendous amount. Like it's I believe it's like 20% of the energy needs of the entire body is just done by the brain alone. And that's because of all the mitochondria that are in there. The more healthy



mitochondria, the larger number of healthy mitochondria per cell in your body and particularly in your brain, the healthier and more stress resilient you're gonna be. So when the ketones are elevated and your insulin levels are down and it really needs to be this dynamic where you have elevated ketones and you have lower levels of insulin. If insulin is really high and ketones are high, that could that's, you know, that that could actually be a pathological state. In some cases people will do like exogenous ketones or something like that. There can be some benefit to that. However, you're going to really get the best benefit when insulin is down and that's because you're either consuming uh you know, very low carb blood sugar stabilizing foods or your fasting right? Or doing intermittent fasting and restricting and compressing your eating window and we'll talk about that in just a minute.

But when that happens, when you have that dynamic now, we really turn up the production of the mitochondria and the mitochondria activate higher levels of uncoupling proteins and these uncoupling proteins create more heat they create, they turn up Mitofsky, which is where they break down old damaged mitochondria. So all of us have damaged mitochondria within the cells of our body. The key is we want to take the raw materials there and recycle them and turn them into new healthy mitochondria, the longer these mitochondria just sit in a cell, the worst that cell is going to function and over time if the mitochondria aren't broken down, that cell could actually turn into what we call a senescent cell or a zombie cell where it's like a cell that's taking up space, but it's really not doing us any good. In some cases it may actually be doing a lot, a lot more damage, right? It may be attracting more inflammatory activity or producing more inflammatory activity.

So we want to get rid of these senescent cells and the ketones will help us do that. So how do we regulate the amount of these ketones in our system? Well, a couple of ways, Number one is making sure that our diet is very blood sugar stabilizing. So we want to get rid of all of our processed sugars and carbohydrates in general. I'm a fan of minimizing if not fully eliminating grains and you know, most starches or at least you know, controlling your intake when you are consuming starch. And then number two is getting rid of bad fats, it's gonna be all of our seed oils, corn oil, soybean oil, safflower oil, cotton seed oil, peanut oil, all of these types of oils really drive up inflammation. And by driving up inflammation, they also damage our insulin sensitivity and they'll end up creating higher amounts of blood sugar and just a vicious cycle of inflammation and high blood sugar and insulin resistance. So we've got to get rid of those and we replace them with healthy fats, coconut oil, avocados, high polyphony, all extra virgin olive oil, grass fed beef tallow is really good grass fed but pasture raised eggs, those are all really really healthy fats that we want to be consuming. And then we want to make sure that we're consuming as much as possible trying to get grass fed, wild caught pasture raised animal





products, we want food that is high in nutrients, low in toxins. So the more organic that we can go and the more you know when it comes to animal products, we're looking at like grass fed pasture raised wild caught as opposed to farm raised, conventionally raised. We're gonna get a lot more nutrient density, a lot less toxins when cows for example eat grass and when they eat just kind of wildlife like wild wild Full right and things that are just growing on a pasture, they're actually up taking all the tertiary pines. The you know, adapted genic qualities of those plants, they're taking up the omega three fatty acids. They actually create something called conjugated linoleic acid which is very anti-inflammatory, supportive of insulin sensitivity and metabolism. They have higher amounts of vitamin A, vitamin E.

All your fat soluble nutrients in their dairy as well as in their meat. So that's why we want to do that. Plus they have a lot less toxins when they're eating conventionally raised grains, they have higher amounts of omega six fats, low conjugated linoleic acid, low fat soluble nutrients and then they have a whole lot, they bio accumulate pesticides, herbicides, things like that. So you get all these toxins in there so as much as possible, we're trying to go organic with you know our produce as well as with our animal products to minimize the toxins, maximizing nutrients. When you consume a meal, you want to make sure you're consuming roughly 30 to 50 g of protein in that meal minimum 30 g. Okay, it may be more than five 50 g if you're like a high level athlete, if you really need a lot more protein and it depends how many meals you're consuming in a day as well. But somewhere in that range is usually a good sweet spot and you want to get that ideally from. Again those grass fed animal products, wild caught fish, you also want to get roughly about 30 g 30 40 g of healthy fats. Now that could be extra virgin olive oil, avocados.

Right? Those healthy animal products like I talked about and then you want a lot of colors. The colorful foods. So your colorful fruits and vegetables have polyphenols more than them. And polyphenols really support your gut microbiome. They have powerful anti inflammatory effects cell regeneration effects that help create new healthy mitochondria within your intestines to create a stronger, more stress resilient intestinal lining. You want to make sure you're getting a lot of these polyphenols and typically you're rich foods. A lot of them will also have fiber in them. Obviously have things like extra virgin olive oil, which is very polyphenols all rich, that doesn't have fiber. But you know, if you're consuming berries, if you're consuming dark green leafy vegetables, if you're consuming bell peppers, tomatoes, red onions, things like that, you're gonna end up getting a lot of the fiber that your body needs as well. So that's what you're trying to focus on with your meals and then really compressing your eating window. And so most people are eating, you know, from the time they wake up to the time they go to bed and they're kind of snacking throughout the day. And when they're doing that, they're constantly releasing, you know, they're constantly creating uh elevations in their blood sugar. And then also they're



constantly stimulating insulin and that's gonna create kind of an inflammatory spiral and lead to insulin resistance. What we wanna do is we want to eat 2 to 3 meals a day in a compressed eating window so that we eating window should really be somewhere between six and 10 hours. So a 10 hour eating window would be like, you wait till eight a.m. In the morning to eat your first meal and then you eat three meals between eight a.m. And six p.m. Okay? If you know, you get home late and you have to, you know, eat dinner at seven o'clock, then consume your first meal at 11 o'clock, right? So 11 o'clock to, let's say, you know, eight o'clock or something like that. So that way, you're, again, you're compressing it in a, you know, 6 to 10 hour eating window by doing that. You have a longer fasting window overnight, and that's gonna allow your insulin to go down your body to start burning fat for fuel and creating these ketones and you start reducing inflammation in your brain and your body.

### **Jason Prall**

Yeah. You know, it's funny when, when, when I think some people learn this information that fat is a good fuel, you know, in terms of ketones, there's sometimes a response of, okay, well, I'm just gonna consume a lot of fat, right? I'm just gonna pound the butter and drink the olive oil and I'm just gonna load my meals full of fat because it's a healthy clean fuel and it's good for my brain. It's good for my mitochondria and I'm gonna get into ketosis and all these things and I find that well, some of that's true, there's this balance that that's being missed in this, right, not only from the fiber perspective and the plant perspective and how important it is to get those, those plants in the diet. but also in terms of the fasting, right? Like most of us, I put myself still in this category, is that there's there's, if I were to fast a little bit more my body, it's gonna burn the fat that it has, I still got some extra stores, Right? Like if we went into a winter, I'd be okay. Right. I'm not I've got a little extra on me still that I can tap into.

And to me that becomes the key, right? It's this metabolic flexibility that I know you talk about a lot. It's like the ability to be able to use glucose as a fuel source effectively and efficiently, Right? So that we're not spiking it in doing this huge roller coaster of blood sugar and insulin all over the place. So, it's like even when I have some fruit, my body knows how to use that fuel effectively. I'm not spiking insulin all over the place. And then when I go into this fasting window, I'm able to burn the fat that I have on my body, right? The fat that's surrounding my liver and and the internal organs, right? And able to use and tap into those extra stores. That's that's that's eviscerated throughout my muscles, right? Like there's fat everywhere around the sheets and it's just tucked in every nook and cranny, right? And that's what we can tap into when we get into this fasting window. And to me again, that becomes the magic. It's it's actually in this not eating aspect. That's where we really learn how to use fat as a fuel source instead of just well, let me consume more fatty sources because while you may, even if you have the ability of your body is is



efficient at burning those fats as fuel, you're still not tapping into maybe some excess fat that you have, particularly around the viscera right in the internal organ systems that we know that is the most damaging, most problematic fat when it comes to overall health, right? So, when we can tap into our own fat stores and use that as brain fuel, that becomes not only fact it from a health perspective long term, but it's also pretty darn convenient. You know, I've done some flying and some things in my life where it's like, I don't really want to eat all this food that's around me or I just, I don't have anything at my fingertips here and I gotta fast for a little bit longer. I can actually, as I get better at fasting with that 10 hour than that 10 hour feeding window, 14 hour fasting, 16 hour fasting window and occasionally even 24 or 48 hour fasting.

Now I get to develop a better relationship with hunger. So this little hunger pang, these little hunger hormones that come on I can now have a better relationship. So yeah, that's hunger. You know, I'm okay, I'm not going to die. I don't actually need that those chips or those crackers that are in there in the cupboard, I may feel like them sometimes and I may get that little urge sometimes, but I don't need them right instead of this overwhelming urge and sense of like I got to eat something that is primarily coming from signals from the gut bacteria, from the hormones you know that that are driving this this desire to eat. And so I think to me again, that's a really big key. Is this fasting. So let me just tell me how you work that into your life and what do you recommend for those that are maybe dealing with a little bit of metabolic dysfunction and trying to get a better rhythm when it comes to their eating.

### **David Jockers, DNM, DC, MS**

Yeah, that is such a really good point. And we want to have that metabolic flexibility again, like you said where we can burn fat for fuel but when we do consume sugar, we're using that as an energy source and we're using it quickly. And so a couple of tools that really help, We talked about that blood sugar stabilizing diet plan when we do that, that creates more satiety and turns teaches our body to burn fat for fuel more effectively and that reduces hunger, creates more satiety where we don't have the cravings were not driven as much for food. I always tell people I honestly very rarely actually ever feel hungry. It's usually when I start eating right, it's actually a trigger now for me, I can fast for you know, pretty good good period of time because I trained my body like today, like i on Wednesdays every, every week I do a 24 hour fast where I eat lunch Wednesday, and then I fast until after my workout on thursday, and then I break the fast and I very rarely feel like, like there'll be like a little bit of like a little bit of hunger, like when I'm feeding my kids, you know, and everything at dinner, but it's not real hunger, like it's something I'm used to, it's like, oh yeah, this would be nice to eat and my body is trained to eat dinner at that time, so it's kind of a conditioned response. But it's actually this hunger hormone called Ghrelin, that's being released from my stomach up into my brain and I've trained it to tell me, okay, now it's



food time, let's eat. But I just say, you know, I'm not, I'm not hungry and I drink a little bit of water and actually drinking some water expands my stomach. Uh it reduces it, inhibits the production of that grill in, I no longer feel hungry, and then I actually get a great sleep that night. And then I'm able to go through my day, you know, the next day I work out and I'm honestly not even hungry after that workout until I start eating. And then I trigger my body to say, okay, now food is available now, we need to make sure we're getting our calories because we don't know when we're gonna consume food again so that I eat a really good meal.

And so that's kind of how you can train your body and that's really where you want to get. And that's what happens when your body starts becoming good at burning fat for fuel. So what I recommend people do to start is start with the blood sugar stabilizing diet, making sure you're getting your protein, your fats kind of in the ratios I was talking about. And that's really important. A lot of people like to talk about what foods, but actually getting those ratios, at least in the beginning, understanding those ratios is really important for creating that sense of satiety. So getting the right amount of grams and things like that. Very important.

### **Jason Prall**

And real, real quick going to add to that too because what you're saying is really important, right, is this I find that when we get into something like that, we take this loose description and then we kind of say, okay, let me just start with this. Let me see how this does right? And then we can play with that a little bit to find the right maybe the right precise ratios where I feel good. And that may take some playing around with too. But and and and monitoring. And I think what you're saying is so important because monitoring, weighing your food or at least looking at, you know, some kind of nutritional facts to be able to to kind of get a sense for these things. It's a little bit of work at first, but once you start doing that then you can start to recognize what you're eating and how how many grams of protein and fat and carbohydrates and fiber and that kind of thing. All of a sudden you become your own expert in in the types of foods you're eating, right? So it's a little bit of work maybe at first but eventually becomes second nature.

### **David Jockers, DNM, DC, MS**

Totally it doesn't take long and really the the idea of getting well is is really like mastering your own health and it's almost like getting a degree, you know, getting like a master's degree in your own health by understanding the unique food triggers that drive you and also understanding how to balance your blood sugar so important and so you get that down, you eat three meals and I recommend starting with a 10 or 12 hour eating window. So you might eat your first meal at seven AM finished by seven p.m. Or you know, you can start with a like especially if you if that seems like it's really easy for you which which it really is especially once you get this this sort of



blood sugar stabilizing diet down then compress it to 10 hours. Eat your first meal at nine a.m. Second meal at let's say one or one or two o'clock and then your last meal at six o'clock and finish by seven. And that's actually very easy if you get the right ratios of protein and fat, you get a lot of fiber and polyphenols in there should be pretty easy. And then, you know, you should rest really well from there. You can start experimenting by compressing that eating window even more. So now you can try an eight hour eating window. And this is probably the most common way that people practice intermittent fast or time restricted feeding is an eight hour eating window where they'll eat their meals between let's say 10 a.m. And six or 12 PM and eight PM.

Something along those lines. And so now you're eating two or three meals in that eight hour eating window. Okay? And then you can experiment and push it to six or maybe four, maybe one day a week, you'll do, you know, just one meal like I do. Now, I will say that young menstruating females, okay, they tend to have a little bit more trouble with, not not across the board, but for some of them, they may have more trouble with a really tight eating window. So they may have to experiment a little bit based around their cycle like the week before they menstruate. They may need a larger eating window, 12 hour, 10 hour, 12 hour eating window. And also they may need more carbohydrates because they need higher amounts of insulin in order to produce, , you know, higher amounts of sex hormones, estrogen progesterone to have the proper, you know, hormone flow and have a proper menstruation and also right around ovulation as well often times and this

### **Jason Prall**

And this makes sense, right? With like kind of evolutionary biology perspective of bearing Children like that. We want the females in that sort of child bearing years, you know, we can't have them starving and fasting all the time, Right? Whereas the males can get away with that a little bit more, females need to be nourished, right? And exactly, a potential new life coming into this world. Right? So, it's like from that perspective, you know, especially some and everybody's constitution is different, right? So some may need more nourishing and support and less of the sort of fasting, aggressive fasting. And it just makes sense intuitively,

### **David Jockers, DNM, DC, MS**

Absolutely what we're eating and the timing of what we're eating is sending a signal to the brain that were either in a period where food is abundant or food is scarce. And when we're young, we're growing really, really fast, we need to be sending a lot of signals that food is abundant in order to have proper growth and development. Okay, now, obviously in our society today we have an epidemic of childhood obesity. So honestly, there's a lot of kids out there that could use a lot more movement, you know, because they're, you know, inside on screens all day or





whatever it is and they're eating processed foods. So today's day and age, a lot of these kids actually could do intermittent fasting. But in general, especially if you have a lean active child, you know, we don't really worry about that, right? Just let them eat real foods, run around, do things like that as we become adults, we stop growing in the same way and therefore we need less. We need to communicate to our body less often that food is abundant. We still do need to communicate that from time to time. We need to cycle through feasting and famine times of famine, but actually activating, you know, basically sending the signal that we're in more of a time of famine stimulates more cleansing healing and tissue regeneration. And that's really what we're trying to accomplish as we become adults. Unless we're like high level athletes, you know, as we're aging, This is what we want to do.

And this is really what helps prevent against neurodegenerative conditions. Is signaling that, okay, turning on autopsy gee, where our body breaks down old damage cellular organelles and recycles them into new healthy mitochondria, new healthy golgi apparatus, right? All these different organelles within the cell. So that is what signaling that we're in a famine and the way that our body knows we're in a famine is a few things, the presence of amino acids in our bloodstream and also the presence of insulin, right? So if insulin is elevated, our body says, okay, food is abundant right now we're going to store fat because we, you know, famine might be coming. Whereas when insulin goes down it says, okay, now we're in a time of famine. And so now we need to break down proteins within the cell so we can use them for energy. And also we can recycle and create a more stress resilient cell, right? A more you know, thrifty cell basically that's more efficient.

And so that this is the signals that our body does. Now when a woman is menstruating for her. To basically that we want to tell the body that we're in a time where carrying a baby would be a good thing. And so for sending too much signals of famine, we the woman will stop ovulating, right? Or if she's getting too much exercise, we call that exercise of gonorrhea, right? Or the woman stops menstruating because her insulin gets so low and she's overwhelming her body with stress fasting even though as healthy as it is. It's actually a stressor on the body. We call it a hormetic stressor. It's a stressor that can make our body stronger and more resilient. But nevertheless it's a stressor. And so this is why a menstruating female needs to be careful with this. And so usually the way that we'll do this is the first week, once, once the woman starts bleeding. Like my wife follows this where when she menstruate, it's okay. That first, basically 7 to 10 days, great time to do intermittent fasting. She'll do a one day fast. My wife does every quarter, four months or so. She'll do like a three day fast and she likes to wait until she meant straits and then she'll do it. And then as she gets a little bit closer to ovulation, she's eating again right? And eating a little bit more carbs, sweet potatoes and root vegetables, fruit, things like that. And then,



after ovulation she can do a fast, intermittent fasting, compressing that eating window and then the week before menstruation, she's doing less, eating window compression, a little bit more carbohydrates, right? You know, obviously healthy foods, but less strict, less rules as far as that goes and really just trying to make sure she gets a lot of calories. And when she does that she knows she has less cravings her cycle. She has very little symptoms and she used to have endometriosis actually when I first met her. So she had really intense cramping and now it's like, she's like, oh, I just started menstruating, right? She's like, oh, it was like two hours of like minor cramps and then that's it, you know.

### **Jason Prall**

I love what you're pointing to here, which is 22 key concepts that I think are huge takeaways. One is the cyclical nature of things and following the cycle, not just a woman's cycle, but the cycle of life and the cycle of all things, cycle of the seasons, cycle of the day, right? There is a time for feast and there's a time for famine. I think there's some pretty important texts that talk about these type of things. There's a time for every under the sun, right? Like there is a time for this stuff. And so, I find particularly with the women that I've worked with and and honestly a lot of men too, that when it comes to intermittent fasting, losing excess weight fixing the sort of metabolic uh issues and and insulin resistance that sometimes slower is better than trying to push too hard. It's too much catabolic stress on the body, right? Because when you fast as you mentioned, right, cortisol rises now, good things rise to, like we have a lot of testosterone, melatonin rises, growth hormones, right? Like there's amazing, beautiful things happening.

And also cortisol, it's kind of the opposite of maybe what some people might expect is this catabolic destructive hormone also very important to balance blood sugar and things, but but going slow can be the more effective, more direct route to get where we want to go. And I find that to be the case, especially for women in childbearing years that it's like going too hard, it's just not good. but but the other side, the other side of going too hard into the fasting is that when we start to introduce fasting and and we lose weight and hormones get under better regulation and better balance all of a sudden menstruation can return for for uh somebody that's in perimenopause, right, or or the symptoms start to go away, everything starts to improve. So this is where again it's not like intermittent fasting or or time restricted feeding is bad or good, it's it's all about the context, how hard you're going, what feels right for you. And again, even within the menstrual cycle, you know, adjusting things and finding the right time for when things are cleansing and detoxing and moving out great time to to add some fasting in there and when the body's building up, making a new egg, getting everything ready, that's the time for building, Right? So it's just really, really cool to point to these cycles that we can pay attention to within our own systems.

### David Jockers, DNM, DC, MS

Yeah, absolutely. I mean it's so key. And then when it comes to neurodegenerative conditions, fasting has been shown to increase brain derived neurotrophic growth factor BDNF which is like miracle gro for the brain it enhances the synaptic activity or the little gaps between the neurons which which enhances the overall connectivity of the brain and connectivity has been shown to be associated with obviously lower rates of cognitive decline but also just faster thought process and being able to link deeper, more intimate thoughts. Like they studied Einstein's brain at stanford, I don't know if you heard about this but they looked at him, they wanted to see if he had the same if he had more. They thought their original hypothesis was that he had more neurons then yeah so he had more neurons and therefore he was able to kind of obviously come up with these incredible equations and think way beyond the box.

But he actually had the same amount of neurons as somebody else that was his age and also his you know basically about the same size as him but what he had was more than twice as many synapses, these little gaps between the brain and you can have up to like 30,000 per neuron and it's amazing to even think about. But these are like little branches that come out of the neuron and connect with other neurons and the level of connectivity in the brain is associated with better cognitive capabilities and so we know that ketones help stimulate BDNF. So when you're fasting, you're elevating ketones which stimulates the production of BDNF. and that really helps there's also other things that you can do like for example omega three fatty acids have been shown to help support BDNF levels. So getting rid of those bad fats. Like we talked about consuming more of these wild caught fish, grass fed butter, things like that. Have more of the long chain omega three S. E. P. A. And D. H. A. Obviously you can supplement those as well. You know there's other things like,

### Jason Prall

What about some herbs? And I know you got a ton of resources on your website. So I know you got some of these lifestyle hacks and morning routine hacks. So what are some of these things too that we can introduce for sure?

### David Jockers, DNM, DC, MS

Well some of the best herbs things like rosemary believe it or not, rosemary is fantastic for the brain helps boost acetylcholine which is when your key neurotransmitters in your hippocampus associated with memory formation. So rosemary is great. Lion's mane is uh you know getting a lot of press these days for its ability to stimulate nerve growth factor which helps with sleep, helps with cognitive uh you know cognitive speed and processing and memory. So lions mane

really a lot of the mushrooms, Courtis, eps rishi, all of those can be really really beneficial. Ash Lagonda. So almost all the adapter genic herbs that you hear about out there really powerful for BDNF production for helping to balance the glutamate to gaba ratio. And this is something ketones do as well. So we have glutamate is an excitatory neurotransmitter helps us think sharply and quickly helps us process memories react to stress really important but if it gets out of balance with the brakes Gabba then we have problems kind of like if you're driving your car and you know your brakes don't work well right? It's dangerous. It's the same thing in our brain and most people because you're eating an inflammatory diet, they're under a lot of stress. They're being exposed to a lot of toxins.

They're indoors on screens surrounded by E. M. F. They're not getting out in the sun, they're not getting their body grounded. Which you know those are powerful things that help they have too much glutamate not enough Gabba. So they have a distorted ratio and that's what blood sugar imbalances do as well. And that creates neurotic psycho toxicity like I was talking about before where neurons die and then they release toxins that now damage all the neurons around them. And it becomes almost like dominoes going down right? And that becomes a serious problem. And all cases of neurodegenerative neuro degeneration like dementia Parkinson's Alzheimer's these are people that have had widespread neurotic psycho toxicity for a long period of time, a long period of time. And so you know getting your body into a state of ketosis through intermittent fasting through a blood sugar stabilizing diet through exercise.

Exercise, don't even talk about that. But that's super important for getting insulin down for telling your body to burn fat for fuel. So getting your body moving and exercising regularly, building lean body tissue, weightlifting. You want to build that muscle tissue, the better your percentage, you know, the more lean body tissue have and lower body fat percentage you have, the better your brain is going to be. So building muscle is super important. Plus when you actually do muscle building exercises, the muscle tissue themselves actually secrete. Believe it or not, your muscle tissue is almost like an endocrine organ. We didn't think about it this way, but we know fat fat is fat releases at a Perkins like left in and add a bow necked in and things like that that play a critical role and actually help help with brain function, but also the muscle tissue does to muscle tissue produces my Akins, which stimulate BDNF in the brain. And so now you get again better conductivity of the brain when you're exercising and building muscle tissue. Getting out in the sun, we know sunshine itself, whether it's in the middle of the day where you're getting the UV A UV. B rays, that's obviously great for vitamin D. Production and optimizing your vitamin D. Is really critical for brain health. We know that across the board people with neurodegenerative conditions have lower levels of vitamin D. And the vitamin D. Again stimulates that BDNF stimulates nerve growth factor, also getting like early morning sun



or or or the sun set, You know, there's a there's a proverb that says, if you want to have great energy during the day, watch the sun rise and if you want to sleep well at night, watch the sun set and you know, it's a feel good, you know, statement, right? And for those of us that really love nature like you and I it's like, oh yeah, that makes so much sense. When we look at the actual physiology, what's happening there? Sunrise is when you have a lot of red light near infrared and far infrared rays.

And so of course you see more of the red light, right? The near and the far infrared are out of the visible spectrum, but they have very powerful anti-inflammatory effect. They stimulate the mitochondria and again, the brain neurons are the most mitochondrial dense tissues outside of the test season, the ovaries. So they're the ones that benefit the most. So it helps create really healthy neurons helps reduce inflammation. Pain in your body. Okay. And that's super critical. In fact, you know, I didn't even talk about pain but pain if you're in chronic pain, we know that chronic pain itself. actual signals of pain degenerate the brain faster. And pain could be obviously due to like a trauma or an injury. But for many people, pain is actually a lack of good stimulation, lack of good tissue stimulation.

Muscle stimulation, lack of getting the right visible spectrum right? The red light. Not getting enough red light near infrared far infrared. These are things that all of our ancestors were exposed to, that people that I know, you traveled all around the world and looked at, you know, all these healthy cultures, they're getting all these rays, they're up at sunrise, they're working outside, they're looking at the sun, they're getting the near and the far infrared. We're waking up and we're going right to our computers right there out there out at sunset, getting all of these wavelengths and we're not. And so it could be chronic pain outside of like a major trauma could actually thought of as a lack of my aachen, my aachen as well as appropriate, receptive activity of the muscles and a lack of getting the proper, it's basically like Malibu illumination. We're not getting the proper stimulation of these rays of light, right? So we're getting poor light stimulation, we're getting artificial lights, not enough of these natural natural light exposure.

### **Jason Prall**

And then heat and cold we can we can go on and on

### **David Jockers, DNM, DC, MS**

Exactly, just getting uncomfortable, you know, with temperature changes, right? So whether it's cold showers, cold baths, whatever it is, like my kids and I so we just had a little bit, you know, for Georgia, it wasn't too bad. I mean the weather got to like, I don't know, 50° at night, but out of our pool we have the saltwater pool. So the water was colder, but it was like a beautiful day





outside. So we all jumped in, it was like cold water colder than what we're used to. You know, you know now the water wasn't 50 the water is probably 68 or something like that, but it's you know, it's colder than what we have been swimming in.

We kind of got that little shock and it was just wonderful, right? It's so invigorating, stimulates your endorphins, stimulates dopamine, you get these cold shock proteins that break down old damaged mitochondria, you get this amazing stimulation and it's something I try to do on a regular basis with cold showers and then also heat stimulation like you're talking about, so getting in whether it's a sauna or working out in intense heat you know, doing something where you can sweat and b and get your body really, really hot. This is something all of our ancestors did in our society, we're not doing it and that lack of getting uncomfortable makes us weaker and more fragile and then we're more exposed to chronic pain, brain degeneration, things like that. We want to really create a strong stress resilient body where no matter what comes at us, our body can adapt, become stronger through it and thrive through it.

### **Jason Prall**

Yeah, I mean, you know the as we wrap up here just kind of what's what's coming to me now, the the thread that you've weaved throughout this conversation is one of getting comfortable being comfortable being uncomfortable and to find the opposites right? Find the light and find the dark, find the cold and find the hot, find the eating and then the not eating right? I mean this is really really profound way to look at the world is kind of we want to be on both sides, we don't wanna get caught in the middle with everything where we're the eating. We're constantly in this 68 degree, you know comfortable room with kind of indoor lighting but not really you know bright outdoor light with red light and U. V. S. You know it's really about getting back to the polar opposites of things, finding the balance, finding the rhythm and getting a little bit uncomfortable in that process. And I find that for me like like most things you know it's uncomfortable at first and then it starts to get like there's a you actually do get comfortable in that discomfort in a way that's hard to put words to because it seems like they're opposites but but in a way that they're not right. It's like sometimes when I mean you talk to anybody who does enough cold thermogenesis, cold pools, cold plunges etcetera.

They start to crave the cold at first. Almost everybody dislikes that ice cold water and they're just like what the heck is this? You're crazy to do it. And then eventually they start to crave it and it's because the body is responding. It's the same thing with fast thing. It's the same thing with exercise, right? It's like when I don't exercise for a while, whether I'm on vacation or for whatever reason, I'm caught at work and I just don't get to do the regular exercise. Getting back into the flow is a little bit of an effort. And then I notice more so than it is when I'm in the rhythm and



then when I'm in the rhythm, it's like I can't not work out. It's it feels so good to my body. So there's a little bit of this discomfort at the beginning of things that we got to kind of push through or or embrace. As the body adapts to becoming more fat burning as the body adapts to handle the cold and handle the heat as the body adapts to the silence. You look at anybody today and we're so overstimulated that sitting in silence with ourselves is uncomfortable by itself.

So, so yeah, it's just it's interesting that you kind of weave that through this conversation. But when we do the, when we do that, you mentioned, it would become anti fragile become so resilient and really, that's the key right for the long term brain health and that's that's where most people are kind of worried about, right? That you're in your own generation. The Alzheimer's dementia. The things that are going to catch up to us later in life. And we now know that they don't just come on uh sometime late in life because of some genetic issue. No no there's a whole lifestyle that has preempted that condition. And so doctor doctor has been fantastic. We went all over the place. I really hope that people got a lot out of this. I think they will. You mentioned so many things that I think people can put into action. and yet you've got a ton of other resources for people. So tell people where they can find more of your work and anything you've got.

#### **David Jockers, DNM, DC, MS**

Yeah, for sure. Well you can find me at [drjockers.com](http://drjockers.com). I have a great podcast. Doctor Jockers functional nutrition podcast and have a great book on fasting. It's called the fasting transformation. So you can check that out as well.

#### **Jason Prall**

Awesome. Well thanks so much for joining us Dr. Jockers and again keep up all the good work. I really appreciate it.

#### **David Jockers, DNM, DC, MS**

Thanks again, Jason