

Paleo Solution - 354

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Robb: Hey, folks, super excited for today's guest. We are back with another edition of The Paleo Solution Podcast. Today's guest is Dr. Stephan Guyenet. Stephan holds a Ph.D. in neuroscience and he is one of the most influential people in the totality of the Paleo ancestral health scene with at least regards to my understanding of the way all these parts and pieces fit together. Stephan is the author of the soon to be released The Hungry Brain and has been the long time contributor to the amazing blog Whole Health Source which, Stephan, you just recently shifted that around a little bit.

Stephan: Yeah. That's exactly right. So, first of all, good to be here, Robb. Thanks for having me on the show. So, yeah, I launched a new website. So, the new website is just my name-dot-com, stephanguyenet.com.

Robb: Nice, nice. So, give folks a little bit more of your background. Like you have a really eclectic background, undergrad in Biochemistry and then heading into Neuroscience, and then clearly a really huge fascination with both nutrition but also steeped in this kind of evolutionary biology framework. How did all that come about?

Stephan: Yeah. So, I've always had a fascination with neuroscience even since I was a kid. I actually studied Biochemistry in college with the idea that it would form a solid foundation for going into Neuroscience, kind of starting small and getting a little bit bigger. Then my thesis work was in neurodegenerative disease and I kind of, during the course of my research -- I just love Neuroscience in general but the particular disease that I was studying was not very prevalent.

It was neurodegenerative disease called spinocerebellar ataxia type 7. And I just kind of decided that it wasn't, I wasn't helping enough people, I guess, would be the simplest way to put it. And so I started learning about other interesting things about the brain and I have a long standing interest in health and nutrition and so I started to try to think about what's the intersection between health and nutrition in the brain.

And it turns out that the brain governs all behaviors and so any behavior such as what you choose to eat, how much you choose to eat, how you move your body, and as well as a lot of the physiology in your body is all governed by the brain. And so it seemed like kind of essential point to start thinking about health and nutrition and particularly eating behavior. During that time, I really became fascinated by the evolutionary perspective and the perspective that was coming

out of the Paleo and ancestral community is about, thinking about evolution as a way to understand who we are today based on where we came from.

And, I mean, this is really kind of a common sense idea. I mean, it's remarkable that it's not more widely accepted. If you go to a zoo, animals eat, animals are fed the things that they would normally eat in the wild and that's what they do best on. You don't feed a panda steaks and you don't feed a lion bamboo. I think that general concept was very inspiring to me as well as looking at data from traditionally living cultures and seeing that they were not suffering from obesity and non-communicable diseases like cardiovascular disease and diabetes to nearly the same extent that we were, that we are.

And that was kind of a light bulb moment for me and I started to try to think, well, what is it about our modern society that causes these things to happen? So, that's kind of what got me into this point.

Robb: That's fantastic and this maybe leads into -- You've been really good at clarifying what I call the macronutrient wars. Like for 50, 60 years we've been in this -- Is it high carb, is it low carb, what's the optimum diet? And, again, this is a kind of fascinating thing because if we pull in this anthropological perspective on this, we have some great examples of cultures that live quite different extremes with regards to like carbohydrate intakes specifically that are quite healthy, like arguably much healthier than westernized populations.

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But we've really been in this kind of macronutrient war. I'm trying to ask this question without it being too leading because I'm completely in the same camp as you with this stuff. I feel like this look at the neuroregulation of appetite really, if you take a little bit of that and a little bit of the orientation from the anthropological perspective, almost in Gordian Knot fashion, we slice through this macronutrient war idea. What do you think about that? Again, I'm trying not to ask too leading of a question.

Stephan: Yeah, yeah, I think that's a great way to think about it. Personally, that's the perspective that I try to take as you kind of take this ancestral framework and you see how it fits together with modern neuroscience and nutrition and obesity research. Before I get into the meat of the question I just want to acknowledge that I think that the optimal macronutrient -- It's not that macronutrients are relevant and optimal level of macronutrients for each individual can be different. That's something that I know you understand very well.

But if we're taking a zoomed out approach and looking at humans generally, I think that it's very clear that there's not really a bad macronutrient and a good

macronutrient. What you see is that the brain is wired to be attracted to all of the macronutrients and they can all contribute to over consumption and ill health, excess body fat and ill health, under certain conditions. But it's not really about the macronutrients themselves. And again, I'm saying this in a general sense.

It's not really about the macronutrients themselves. It's about other properties of the food that can be, that relate to those macronutrients. So, for example, calorie density and palatability. Those are things that have a very powerful impact on food intake and body fatness but those are things that they arise from the presence of concentrated macronutrients in that food. So, for example, adding fat and sugar to things increases their palatability and calorie density.

But that doesn't mean that fat and sugar are inherently calorie dense or highly palatable. So, a piece of fruit, for example, the calories are almost all from sugar but that's not the calorie dense hyperpalatable food. I mean, it tastes good. It's not a bad tasting food. It's a satisfying food but it's not ice cream or cake. And then same for fat. You could be eating -- I guess, ice cream works for that one as well.

Or you could be eating something that is a piece of meat or some full fat dairy or an egg or something else that has a lower calorie density and a more moderate palatability and that will support regulation of calorie intake and body fatness at a healthier level. So, it's not really, just in a general sense, it's not so much about the macronutrients themselves. It's about these higher level properties that macronutrients can contribute to.

Robb: Right, right. So, help me with this. Like if we look at physics, like we have Newtonian physics and mechanics and electromagnetism and what have you, when people have been looking at kind of the health story around eating, there'd been ideas around the insulin hypothesis and some people kind of skirt around the palatability story. Like there was a volumetrics a number of years ago where you just need to kind of fill your belly up. But I haven't seen until you really started talking about this stuff anyone that had thrown out some like first principles type elements that these are the foundational kind of vectors from an evolutionary perspective that is governing this stuff.

And again, I've got an idea in mind that I'm trying not to ask too leading of a question. But what are those just like Newtonian physics, quantum mechanics fundamentals, $E = mc^2$ type underlying mechanisms that really kind of bracket our neuroregulation of appetite?

Stephan: Yeah, I'm really glad that you said that because that's exactly what I was going for is a kind of first principles dissection of human eating behavior.

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And, I think, if we go back to the very fundamental driving force of all this, it's natural selection. So, humans, the human brain has been shaped by natural selection and the currency of natural selection is having as many offspring as possible. And so how do you have as many offspring as possible? Well, one of the key elements of that is getting food, getting energy.

Food is not just energy, of course. But as it turns out, if you model, and I'm not just talking about humans here, I'm talking about a variety of different omnivorous species, if you model their behavior, their foraging behavior, what you come up with is an equation called the optimal foraging theory equation. This is kind of the basic equation that explains a lot of animal foraging behavior. And that is that the value of a food item is equal to the number of calories it contains minus the number that it takes to obtain it divided by time.

This is just a very simple economic equation. This is used in economics as well to maximize profit. It's just a value maximization equation. Calorie return rate, is all it is. The calorie return rate of food is the number one determinant of foraging behavior both in non-human omnivorous species and in humans. This has been tested in hunter-gatherer cultures living like our ancestors did.

And so very, very deeply wired into our brain, we have this economic principle of seeking calories for the purpose of sustaining ourselves and being able to reproduce and fulfilling the requirements of natural selection. And so, we're very much wired to be seeking calories. But interestingly, we're not really aware of that. You don't think in your head, "Hey, I need to get some calories." At least most people don't. What you're thinking about, because natural selection hasn't really wired us with a specific calorie drive necessarily, what is wired us with is a number of sub motivations that kind of are short hand for this ultimate drive of getting calories.

These are things like carbohydrate, starch, fat, sugar, protein, glutamate, which is the umami flavor and salt. And these are substances that are hardwired in the human brain as being motivating. And we have sensors in our mouth. We have sensors in our digestive tract that detect those specific chemical substances and signal it back to the brain where it spikes dopamine. And dopamine is what reinforces behavior.

So, anytime you eat a food that contains these things that the brain is hardwired to like, your brain records everything that was associated with that situation. So, the flavors, the aromas and flavors of the food, where you were when you ate it, how you got it, and it reinforces all those things so that you're more likely to eat

those same foods next time. And so, basically, what happens is the brain, it regulates, over time, it regulates your motivation level for various types of food to tune your motivation so that you are seeking the food properties that you are hardwired by natural selection to seek.

And so, anyway, that's just kind of a general overview of why we're motivated by certain nutrients and not by others. Like, for example, Brussels sprout is a great example. Adults often end up enjoying Brussels sprout but kids usually hate them and kids don't really like vegetables that much in general. Most kids could really take or leave vegetables or even actively dislike them. And the way we come to like vegetables as adults is by repeatedly associating the flavors and textures of them with things that the brain inherently likes like fat and salt. And so if you have Brussels sprouts with fat and salt enough times eventually your brain is like, "Oh, hey, Brussels sprouts are really good."

Robb: Not so bad.

Stephan: Yeah. These are a great source of fat and salt. I kind of like these things after all even though they taste kind of bitter. But the brain doesn't really care about micronutrients.

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Except salt. That's the one thing we can taste and that's the one thing that's rewarding. But, I mean, thiamine, iodine, magnesium, we can't taste those things. The brain does not actively care about those things. Those are things that it kind of assumes are going to come along with the macronutrients we eat because in the time of our ancestors they did because there was nothing but whole food available. So, you couldn't meet your calorie needs without meeting your micronutrient needs.

Robb: Right. Stephan, there's kind of a dueling banjo that plays against optimum foraging strategy in the form of palate fatigue. Can you talk about that a little bit?

Stephan: Yeah, absolutely. So, this is a very fundamental property of the nervous system that's called habituation. And this goes all the way back to jellyfish which, I think, I can't remember how long we diverge from them, something like 600 million years ago.

Robb: Or six weeks depending on -- Yeah, yeah.

Stephan: And basically, it's just a very fundamental property where if you offer a stimulus over and over again within a short period of time the nervous system will

become desensitized to it and start to ignore it. And that's because it's not conveying any new information. And so this happens every time we sit down to a meal. If you eat, if you're eating, let's say, a piece of chicken and a potato, you're eating them, you're eating them and you're eating them, and you're gradually becoming tired of that and less motivated to continue eating it.

And if you test someone at the end of that, if you ask them, "Hey, how full are you?" They'll say, "I'm plenty full. I don't want any more food, certainly not chicken and potatoes." But then if you offer them a different kind of food that has a different sensory profile, something like something sweet, a piece of fruit or cake or something like that, then they'll be ready and willing to eat more calories even after they have satiated themselves on those other types of food.

And this is a phenomenon called sensory-specific satiety. It actually is, it's remarkably -- I mean, for as kind of simple as a concept is, it's remarkably influential of our food intake. And, I think, this is something that's very easy to kind of demonstrate to people intuitively because we know we do that when we go to buffets. I mean, I know I do it. I can overeat spectacularly at a buffet because every other bite you're eating something different. Like take me to an Indian food buffet and it's going to be destruction.

Robb: Right, right.

Stephan: Just when I thought my stomach was about to explode there's the rice pudding. And so sensory specific satiety can cause us to basically blow by the normal systems in place that normally would limit appetite at a meal.

Robb: Let me throw out a scenario that I saw on TV like six years ago and then maybe you can walk folks through how well this stuff is actually playing out. So, there's this guy, Adam Richman, he did a show Man versus Food where he would go do these epic food eating challenges. Like there was a 72-ounce steak that needs to be eaten in X amount of time. And there's one show just stuck with me forever clearly. It's still with me.

But he had a kitchen sink ice cream challenge which was basically like eight pounds of ice cream turned into an ice cream sundae, hot fudge, sprinkles, the whole nine yards and they literally bring this thing out in a kitchen sink. Richman starts digging into this thing and he gets to maybe about a third of the way through it and he just bugs down. And, I mean, the guy is literally turning green. He's like drooling, like that pre-vomiting kind of thing going on.

And then he calls an audible, and he asks for a plate of extra salty, extra crunchy French fries. And he starts nibbling on a French fry and taking a bite of ice cream and nibbling on a French and taking a bite of ice cream. And from the standard

kind of dietetics model, we would say, well, he's eating more food so his belly is fuller so he should be more full. But he was actually able to finish the ice cream by eating more food. Could you walk people through that? To me, that's just so powerful and we could potentially consolidate both of our books down to basically like that. There you go.

Stephan: That's awesome. Do you talk about this in your book?

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Robb: I do. I do. I have a link to it, and the YouTube piece to it.

Stephan: That's awesome, yeah. I wish I had that for my book too because that's a great, great example. That relates to sensory-specific satiety just like you said.

Robb: Because ice cream is amazing. So, how did he bomb out? He's like, "Man, I'm going to throw up if I eat more ice cream." What happened there?

Stephan: Yeah. So, that's amazing. I bet the first few bites of that were outstanding and then after that it went downhill. But, anyway, yeah that's sensory-specific satiety. It allows you to kind of push past your normal satiety limits. I think that's a really great example of, it's a really great way to illustrate what satiety really is. Because satiety is not this mechanical thing of your stomach filling up although stomach fullness is a major part of it. It's part of the signal.

But what satiety is it's a sensation and a motivational state or lack thereof that is generated in your brain. And so people tend to think of their stomach as being full when they feel satiated but, in fact, generally your stomach is not full. That's the point at which your brain says, "Okay, you have enough." And there are a lot of different signals that plug into that. Some of them, one signal is stomach distension. Another signal is those chemical signals I was talking about earlier where your digestive tracts detects the chemical properties of food such as fat and sugar and carbohydrate and protein content, and sends that signal up to your brain stem.

All that stuff gets integrated into a satiety signal. But there are other things that are getting plugged into that too. There are signals about the palatability of the food. There's the sensory specific satiety of the food. There's a lot of other things that are coming and being integrated into that sensation of satiety that is also related, if you push too far then it starts to turn to nausea. Those two things are related to one another.

Robb: Right. How did the French fries override that? It's just so amazing to me. To succeed in eating the ice cream, he ends up eating probably like a thousand

calories more in the form of these French fries, which is a huge whack of food in and of itself.

Stephan: Yeah, that's amazing. I can't give any definitive answers but I would have to assume that it is related at least in part to sensory specific satiety.

Robb: Just changing that signal just enough so that we may quiet the overwhelming signal of like creamy, cold, smooth, because it's juxtapose against salty, crunchy, savory. Like they're about as opposite as you could get. Like if you put a sriracha on the fries it may be the only way to change it.

Stephan: Yeah.

Robb: So, Stephan, given what you understand about optimum foraging strategy juxtapose again with this idea of palate fatigue, again this push and pull dueling banjos which we've seen to find everywhere in biology. We've got that as kind of like our basic operating system, like our Newtonian physics of how appetite and kind of our energy regulation is managed with a macro and micro level.

Now, let's look at the recommendations that we get from the medical establishment particularly dieticians, which we have these seemingly intuitively accurate concepts like everything in moderation, eat less, move more. Why did those recommendations fail? Why are they -- Okay, and again, I'm asking too leading questions. Do they fail? And if they do fail, why are they failing given what we know about evolutionary biology, neuroregulation or appetite optimum foraging strategy, et cetera?

Stephan: Yeah. Well, I want to start by kind of acknowledging that there are different approaches within nutrition community to try to help people manage their weight and be healthier. I think that the worst approach that is applied -- I shouldn't say worst but I should say least effective for the average person is simply recommending portion control without giving more information about how to make that happen in a sustainable way.

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And the problem is that counting calories in and calories out is not really an intuitive way of interacting with food. That's not normally how we interact with food. The way we normally interact with food is we eat it when we're hungry or tempted and we stop when we feel full. So, I think personally the best -- And again, some people count calories and it's successful for them. I'm not knocking that if that's what works for you.

But what I'm saying is that I think for most people the most sustainable strategy is to give your brain the right cues so that your hunger and your temptation and your satiety are happening in a way where it's supporting your goals. And so that has to do a lot with your food environment, what sensory cues you're surrounding yourself with and how that affects your food motivation. But it also has to do a lot with the properties of your food such as the calorie density and palatability of that food.

Robb: Do you feel like there's an argument that to some degree orthorexia -- And by orthorexia, I mean, people have to kind of pick some sandbox to play in whether they decide to be kind of high carb low fat vegans or lower carb Paleo-esque keto type people or whatever. But it seems like that trying to navigate that middle ground of having just a little bit of Twinky or just a little bit of little Debbie Snack cakes and stuff like that.

Those are the people that remind me of the new surfer that can't get out past the waves. They're the ones that's getting pounded on the rocks. Again, like my sense in running -- I'm on the Board of Directors of a medical clinic and we had to hire and fire, I mean, like 20 dieticians before we could get to a spot where we're like this is what we're going to do, this is the program we're doing, we'll modify from there. But there was this anxiety about limiting food options at all.

I mean, like profound anxiety. And they were really in this deal where like, "Oh, no, they just need everything in moderation." Gretchen Rubin did some pretty interesting, just kind of personality typing research and in general dieticians are pretty good at moderation but about 50% of the population maybe isn't that good at moderating and I even noodle on that a little bit. I can moderate with sweets pretty easily. I'm not all that fired up about sweets.

But get me some sea salt and vinegar potato chips and there's really no off switch for that. I could actually experience palate fatigue on that. It just keeps going. So, I feel like it's likely highly individualized as to what these potential triggers are and what the secret sauces. But I kind of feel like it's doing folks a disservice not saying, "Hey, man, it's okay if you limit your palate options to some degree." And you might pull something out that may look extreme from the standard dietetics model but, in fact, is still nutritionally balanced. You're getting all your macro and micro nutrients dealt it. It's okay and it's not disordered. What do you think about that?

Stephan: Yeah. This is a really good topic, really interesting topic and it's a difficult one. I was listening to a podcast by Danny Lennon the other day, Sigma Nutrition Radio, and he had a guest on. I don't remember the guy's name but he made a point that I think is really interesting in this whole orthorexia debate. And he basically said that -- Because there are people who are arguing essentially that

it's unhealthy for us to be restricting certain types of food, that it promotes disordered eating and that sort of thing.

He was basically saying exerting willpower over your behavior is just kind of a feature of being an adult and we exert willpower over not being violent toward other people in our society and if we don't do that we suffer major consequences. And I think not being able to control your impulses -- I don't think controlling your negative impulses is a bad thing necessarily. I recognize that there are people who can get into trouble by doing that excessively and I'm not trying to trivialize that.

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But I think exerting some control over your diet is a very good thing when going with the flow is going to make you obese and ill. You have to do something about it. I think that being moderate, I think that can work for some people. I think it can work for some people and, I think, as you said, for other people, it just doesn't work. And, I think, it's hard to, when you're around very tempting food cues, things like salt and vinegar chips or soda or cookies, things like that, pizza, I think it's very difficult for people to be moderate.

And I certainly find that. I mean, you put me in front of a box of pizza and you tell me, "Hey, just have one slice." It's not going to go so well. And that's me and I recognize that not everyone is like that. But, I think, a lot of people are like that. And, yeah. It's tough though because there's real life and there's the fact that people go to restaurants and they go to their friend's houses and they're going to be exposed to foods and it's pretty tough to say like, "You can't eat any of this."

It's a really difficult balance to strike. But I do think that if you're trying to control cravings and you're trying to control excessive food motivation for unhealthy foods and you're trying to control your weight, definitely if you can completely avoid some of those problematic foods, that is the optimum strategy. And part of the reason is simply that you're not eating things that are calorie dense and unhealthy and not overeating as much.

But part of the reason that the long view is that these reward associations that your brain makes, they kind of fade over time. I think this is probably a lot of people in the alternative or, I should say, the ancestral health and Paleo community have noticed this, is you don't eat these foods for a while and they stop having the same pull over you. So, I mean, for me, when I was a kid, I liked soda. I don't know that I loved it but I liked it. I enjoyed it through my teen years, through high school. And I basically didn't drink soda for years.

And now I don't like it. It tastes too sweet to me. It tastes like I'm drinking sugar water and I don't like that. I don't like juice either. And I say that it's not that I don't like sweet things. I love ice cream. I love cookies. But soda, I haven't had it in years and that reward association is gone. And so, yeah, I think that it's -- I don't think it's unhealthy to cut foods out completely at all as long as you're not taking your diet to a place where it's so restricted that you're either not getting the nutrients you need or you're in an unhealthy place psychologically. As long as those two conditions are met, I think it's totally fine to completely cut foods out of your diet.

Robb: Okay, that helps a ton. To your point, it's a highly nuanced story. I think that this is some of the challenges. Folks come into, they come into the scene wanting to eat better, wanting to be healthier. And so on the one hand you want to have these simple guidelines to provide so that they're not blown out of the water with a bunch of nuance and detail. But then at the same time these simple guidelines get turned into religious doctrine that then you don't have any latitude one way or the other on it. It's a constant back and forth on that.

I guess, it kind of guarantees job security for us. I don't think anybody is going to swoop in and like fix this problem out from under us immediately. So, whether that's good or bad, I'm not totally sure. But let's circle back to kind of the macronutrient wars little bit. We see people still doing the dueling banjos of high carb low fat plant based diet is the business. Low carb even heading into ketogenic diet is the only way that humans should eat. We see profound success stories at both ends of those spectrums. What are the laudable elements about both of those approaches and then maybe what can we extrapolate from all that?

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Stephan: Yeah. I think that's a really great thing to acknowledge that you have these amazing success stories on both ends that kind of make it pretty hard to, from a 10,000 foot view, demonize one macronutrient and canonize another. That being said, I don't at all dispute that people have, sometimes they have great results from low carb diets, they have great results from super low fat, these super low fat diets. And I think which one suits which person is fairly individual.

But, I think what it boils down, there's a few different things. I think one of them is that when you cut out fat or you cut out carbohydrate, you are removing a major reward factor from your diet. You're removing one of the primary factors that the brain -- One of the primary factors that drives food motivation. And you're also cutting things off the table that would otherwise be on there and that has a major effect on sensory-specific satiety.

Another thing, I think, for low carb in particular is that it tends to be higher in protein and that also tends to control appetite. I think there may also be something to the kind of like shifting the metabolic state to a more fat dependent state relative to carbohydrate in terms of kind of like evening out the highs and lows of appetite. This is something that I've noticed too. I ate a low a carb diet for maybe like six months years ago.

I noticed my total calorie intake didn't change but I did notice that I didn't quite have the same like timing of appetite as I used to. It wasn't like -- Like now, I eat a higher carb diet and I know when it's lunch time. I feel it. It's time to eat lunch. When I was on a low carbohydrate diet, it was like, if I don't eat lunch for an hour it's not a big deal or maybe if I don't eat lunch at all and then have a bigger dinner it's not a big deal.

I feel like, I could see how it could kind of take the edge off around meal time if you're trying to restrict your food intake or your calorie intake. Or, I should say, if you're trying to change your diet in a way where you want to lose weight. And so, I think that all of that kind of comes together. I think the other thing, I think another thing that kind of thrown into the pot is, from the body's perspective, the optimum macronutrient composition is to get tons of everything.

I mean, that's what we're motivated for. That's what we're hardwired for. Nobody wants to give up carbohydrate and sugar. Nobody wants to give up all of fat. We want to eat all of that stuff. And that's what people do if they're not restricting their diets generally. And we want to eat meat, we want to eat starch. We're very motivated by all that stuff. And I think once you kind of force the body to -- Once you cut out one of those major sources of energy and metabolic metabolites, you kind of put the body into a place where it's operating less efficiently.

And I'm talking about when you go to an extreme. This doesn't really happen so much in the middle. But when you go to an extreme, you're kind of putting the body in the metabolic state where it's kind of off kilter, not really getting what it wants. And that may come across as negative but, I think, inefficiency actually can be a good thing particularly when you're in a state where you're already suffering from the consequences of excess calorie intake.

Inefficiency means that you're burning more calories. And we see that very, very low carbohydrate diets and also very, very low fat diets both seem to increase the metabolic rate a little bit. It's not a very large effect but it's very small increase. I think that supports this kind of inefficiency thing.

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And interestingly, you see the same thing in micronutrient deficient states. So, in micronutrient deficient states, you see a loss of appetite and weight loss. And this is true across a variety of different micronutrients. And then when you reintroduce the missing nutrient you get weight gain. I think the body just kind of, when you take away something major that it wants, it kind of conquers down and goes into conservation mode and cuts back on a lot of stuff.

Robb: That totally, totally makes sense. It is interesting. Over the course of time I've played around a lot with the macronutrients that I take in, trying to keep things pretty much the same caloric level, but a few more carbs here reducing fat or flipping that access a little bit. I just kind of notice that if I'm around 75 to 150 grams of carbs a day, I seem to be in a pretty good sweet spot where I've got enough carbs to do hard physical activity like Brazilian jujitsu and stuff like that.

But to your point on the appetite piece, when I was eating more carbs in the past, when I got hungry it was like danger-ville. In my youth, I remember when I was eating my current meal I was thinking about what I needed to do for the next meal. When I hit that low, that hypoglycemic point which is now looking back recognizing what that was, it was a disaster. I was like tunnel vision, shaky, cognition just out the window, super irritated and agitated.

So, when I first came into this way of eating, it was more this kind of low carb ketogenic kind of story. And it was like literally having shackles lifted off of me. Oh, I could go six, ten, 12 hours without eating and I'm still functional. So, it was a pretty dramatic impact on me which is a wonderful thing for cognitive bias assuming that it's the right way for everybody. And I ended up breaking a number of our clients by recommending really low carb diet and they would lean out and they're doing cross fit and then they would start getting signs and symptoms of adrenal fatigue and whatnot. And it took a while to realize once they're not actually metabolically broken anymore they probably need some carbs to be able to run this engine efficiently.

Stephan: Yeah, yeah. That's interesting. I mean, that's great that you found a way of eating that really supports your lifestyle as well as leanness and metabolic health.

Robb: Right, right. Well, 20 years of fiddling you hope that you get somewhere with it. So, yeah. Stephan, I'm just so excited for the release of your book, really excited for all the projects you have going on. Remind people where they can track you down on the interwebs and then also tell them when the book is being released, the title and all that stuff.

Stephan: Yeah. So, the book will be released on February 7th. It's titled The Hungry Brain: Outsmarting the Instincts That Make Us Overeat. And you can read more of my

work at stephanguyenet.com. And then also Twitter account is @whsource and then a lot of my previous writing is at wholehealthsource.org.

Robb: Awesome. Well, thank you again for coming on the show. Again, I just can't thank you enough for the contributions that you've made to my understanding of all this. You were the first person that really put the endotoxemia kind of evolutionary biology framework in front of me and that was just a huge connect the dots moment. I think that Mat Lalonde pinged it to me but he found it on some of your writing and then clearly this neuroregulation of appetite story.

I kind of feel like going forward, if folks aren't thinking about this overeating story from the perspective that you put forward in the hungry brain. Like they're really kind of peeing in the wind. We've really gotten beyond protein, carbs, fat and just insulin or just leptin. It's highly complex story. But using some of the framework of optimum foraging strategy, palate fatigue, we get some ways to take this complexity and manage it in a realistic fashion and I hopefully moved the story forward in a much more accurate ways. I can't thank you enough for all the work you've done.

Stephan: Thank you. I appreciate that.

Robb: Awesome. Well, are you going to be at AHS or Paleo f(x) or anything? Will we see you out and about at all?

Stephan: I believe I'll be at AHS, not 100% sure yet but probably.

Robb: Okay. I look forward to seeing you there. Take care and hope to see you soon.

Stephan: Thanks. Likewise. Take care. Bye.

[0:45:21] End of Audio