



Transcript: #471 The Hidden Epidemic of Nutrient Deficiency with Chris Kresser

Dr. Wendy Myers:

Hello, everyone. I'm Dr. Wendy Myers. Welcome to the Myers Detox Podcast. Today, we have one of my health heroes, Chris Kresser, on the show, and I've been following his work for a really long time. He has amazing, amazing research on his website. Just really a great podcast, Revolution Health Radio, and I highly recommend it. Today we're going to be talking about the hidden epidemic of nutrient deficiency. We touch on that on this show, and I talk a lot about mineral deficiencies and nutrients needed to detox, but today we're going to talk about, just in general, about the epidemic of nutrient deficiency. We'll talk about the foods that are most nutrient dense. We'll talk about if you need a supplement for optimal health. We'll talk about the issues with the carnivore diet versus the vegetarian and vegan diets, some of the inherent nutrient deficiencies that are seen across the board in vegetarian and vegan diets, and what people need to look out for and supplement with.

We also talk about the problem with the RDAs, the recommended daily allowance of nutrients, and why they're grossly inefficient in giving us information about our nutrient needs. They're much higher than the RDAs. We also talk about the bioavailability of nutrients and how the nutrient level on a label doesn't mean that's what you're getting in your body. We talk about the most bioavailable foods or where the nutrients are most bioavailable. We also talk about the issues with phytates and oxalates, and other things in food that bind to nutrients and minerals and make them less available.

We also talk about the issue of so many things working against the absorption of nutrients, so it's no surprise that the statistics that Chris quotes today in the show are pretty grave, how we have such a huge amount of magnesium deficiency, vitamin D, just so many different nutrients that people are deficient in. So, stay tuned. This is an amazing, amazing show. Even for people that are very well educated on nutrition, you want to pay attention.

I know you guys listening are concerned about your heavy metal load and your toxin load, so I created a quiz at heavymetalsquiz.com. It just takes a couple seconds. After you take the quiz, you get your results, and you also get a free video series on how to detox your body, all your frequently asked questions about detox, the best supplements for detox, the best tests for detox, and just so many other questions and searches. Go take that. It takes just a couple seconds at heavymetalsquiz.com.

Our guest today, Chris Kresser, is an acupuncturist, and he has an MS. He's the co-founder of the California Center for Functional Medicine, the founder of the Kresser Institute, and the host of the top-ranked health podcast, Revolution Health Radio. He's also the creator and founder of chriskresser.com and The New York Times bestselling author of The Paleo Cure and Unconventional Medicine.

He's one of the most respected clinicians and educators in the fields of functional medicine and ancestral health, and he's trained over 2000 clinicians and health coaches from over 50 countries in his unique approach. Chris was named one of the 100 most influential people in health and fitness by greatist.com and has appeared as a featured guest on Dr. Oz, Time, The Atlantic, NPR, Fox & Friends, and other national media outlets. He currently lives in Park City, Utah, with his wife and daughter. You can learn more about Chris and his work at chriskresser.com and adaptnaturals.com.

Chris, thanks so much for coming to the show.

Chris Kresser: Wendy, it's a pleasure to be here.

Dr. Wendy Myers: So you focused recently on nutrient density and really talked about nutrition and why people are so nutrient deficient. So, can you talk a little bit about why nutrient density is so important when it comes to your diet?

Chris Kresser: Yeah, so there are two types of nutrients we can get from food. One is macronutrients, so protein, carbohydrates, and fat, which everybody is familiar with. The second is micronutrients, which are vitamins, minerals, phytonutrients, and other trace compounds that we can find in food. I think most of the focus over the last few decades has been on macronutrients, all the low carb, low fat, high protein, low protein. This is what has dominated the headlines, and it's important. It is. Macronutrients are very important. We can't live without them, and the ratio of micronutrients that we eat can have a big impact on our health.

However, micronutrients, I would argue, are a bigger lever for most people in terms of the impact that that's going to have on their health and their longevity. We know we need about 40 micronutrients to function optimally. Dr. Bruce Ames, a renowned microbiologist at UC Berkeley, has done pioneering research here. He argues, and I agree with this, that maximizing our intake of these

micronutrients should be the primary goal of our diet because suboptimal amounts of any of these nutrients can contribute to the development of chronic disease and even shorten our lifespan. The bad news is that almost 100% of people living in the developed world, even in the United States, the richest country in the world, are suffering from at least one micronutrient deficiency and often several.

Dr. Wendy Myers: Why is that? Can you talk about different reasons like soil stress and people's horrifying diets that they have?

Chris Kresser: Yeah, that's a good word for it. Horrifying. Yeah. I mean, I'm sure most of the listeners of your show, I think they're probably not in this category, but 60% of the calories the average American consumes today come from ultra-processed food. Not just processed food but ultra-processed food, so these are cookies, cakes, crackers, chicken nuggets, pizza, soda pop, candy, all of the packaged refined foods, junk foods, and snack foods. These foods now comprise over half the calories that the average American eats. The problem is they're very high in calories, and they're very low in nutrients. In fact, in some cases, they're virtually devoid of nutrients. Refined flour, refined sugar, and industrial seed oils like soybean oil, corn oil, et cetera, which most foods are processed in, have almost no nutrients. Yet they are loaded with calories and other things that, when over-consumed, are highly problematic, so that's reason number one on a broader, societal scale.

For listeners of your show, we hope that that doesn't apply to them as much, at least, but there are other reasons that even people who are eating a relatively healthy, nutrient-dense diet can get into trouble. One, as you mentioned, is the decline in soil quality. The interesting thing about this is it's not that the nutrients are no longer in the soil. It's that the plants can't extract the nutrients from the soil as well as they used to be able to, and that is because we've disrupted the microbiome of the soil. So the microbes in the soil, one of the roles they play is they help plants extract nutrients from the soil. When we kill those microbes in the soil with chemical pesticides, fertilizers, and industrial and agricultural methods, then the plants can't extract the nutrients in the same way. Then the animals that eat plants can't extract the nutrients in the same way, so that's a big factor.

One study I read suggested that we'd have to eat eight oranges today to get the same level of nutrition that our grandparents got from eating a single orange, so that's a pretty profound change in just a couple of generations. Then similarly, we have a global food system now, which certainly has some benefits, but one of the biggest downsides is as soon as you harvest a plant out of the ground, it immediately starts losing nutritional value, so if it takes 2000 miles for a carrot to reach your plate as the commonly shared statistic goes, then it's going to be losing nutrition every mile on that journey. By the time it does reach your plate, it's not the same carrot from a nutritional perspective as if you were to just go out in your backyard and pick it up or buy it from a farmer's market.

Environmental toxins, I know this is an issue that's close to your heart. Toxins interfere with nutrient absorption. That's everything from glyphosate to heavy metals like lead and cadmium, arsenic to organic chemicals like plastics, and bisphenol A. There are so many toxins in our environment now, and some of the minerals that we need to function properly, they try to protect us by binding to these toxins, which is a good thing, but then the bad thing is that we don't absorb that mineral anymore. It can be problematic when we absorb the mineral and the toxin. I don't need to tell you what problems that can cause.

Then the last thing I'll mention is that there are many more factors, but I'll just mention one more, which is that chronic disease impacts nutrient availability in a couple of different ways. Number one, it decreases our absorption of nutrients, particularly any chronic health condition that involves the gut, which is the most chronic health condition. The second way that it impacts things is if you have a chronic disease, you actually have a higher need for nutrients because a disease is a stressor on the body, and stress increases the need for nutrients. So chronic stress, and chronic disease, will all increase the demand for nutrients, so we get hit on both sides with that one.

Dr. Wendy Myers: Yeah, I think even if you eat an amazingly healthy diet, there are so many things working against nutrient absorption from the poor gut lining, toxins affecting our microbiome and gut lining, and stress. There is just so much glyphosate, all these different heavy metals, and pesticides that decimate our microbiome.

Chris Kresser: Yeah, exactly. We live in a really different world than even our parents did, and especially our great-grandparents, and further on the back from there. I would love to be able to just get all the nutrients I need from eating food. That's what I prefer. I got to be honest. I don't like taking supplements very much. I'm not very good at it. I tend to forget. I'm a bad patient in that regard. In a perfect world, I would just eat my nutrient-dense, healthy food and call it a day. That would be it, but I know from my clinical experience working with well over a thousand patients in my career and training thousands of healthcare practitioners, and testing virtually everybody that I saw in the clinic for a nutrient deficiency that I can really count on two hands the number of people who didn't have at least one but often multiple nutrient deficiencies.

Again, my patients are not eating Cheez Doodles and drinking Big Gulps, or eating donuts. I mean, at least not regularly. They were people who'd followed my work for a long period of time, were already eating some type of nutrient-dense diet like Paleo, a Mediterranean type of diet, and doing a lot of the right things. Yet they were still coming up short, and that was what really opened my eyes to this issue because if these people who are highly educated and highly motivated, doing all the right things, they're still nutrient deficient, then I knew we had a problem on a much bigger scale.

Dr. Wendy Myers: What nutrients are people most likely to be deficient in?

Chris Kresser: Well, that's a really good question, and one that you would think would be very easy to answer. There are some pretty easy answers, but I think one of the biggest issues with nutrient deficiency is that we're not looking enough. We're not testing people routinely. I mean, most people I ask say, "Hey, last time you went to your primary care doctor, did they do a full nutrient test?" "No." If you're lucky, you get tested for vitamin D, maybe a couple of others, but it's extremely rare, in my experience, that someone goes to the doctor and gets a full nutrient analysis. It just rarely happens, so you have to take the data that we do have with a grain of salt for that reason. It's incomplete, and it's often based on food frequency questionnaires where people are reporting on what they sometimes ate weeks or months ago, which is totally unreliable.

I hardly remember what I ate two days ago, much less two months ago. But with those caveats, we can look at data from the Linus Pauling Institute, which keeps pretty good track of this stuff, and 100% of people don't get enough potassium, 94% vitamin D, and 92% choline. I think it's around 92% magnesium if you use the latest figures, 89% vitamin E and the high 80s for EPA and DHA, which are the long-chain omega-3 fats. Then it just goes on down the line from there. I mean, as you can already see from those numbers, we're not talking about small percentages of people. We're talking about the vast majority of people being deficient in; I just named five different micronutrients, so it's a widespread problem. Again, one of the biggest misconceptions is that nutrient deficiency only occurs in the developing world. That's absolutely not true. It's a huge problem even in developed countries like the US, Canada, Australia, and the UK.

Dr. Wendy Myers: Yeah, it makes sense. I mean, we have worse diets and probably more stress in various ways, so let's talk a little bit about minerals. I mean, people are very deficient in minerals, and magnesium and zinc, calcium, selenium is a huge problem, lithium. I mean, everyone I test is deficient in selenium and lithium and low in magnesium and other things that are needed for the body to work.

Chris Kresser: Iodine, a lot of people are low in, yeah.

Dr. Wendy Myers: Yes.

Chris Kresser: I think minerals are more impacted by what I've seen from soil depletion than some of the vitamins that tend to be in plant foods. I think they also are affected more by toxins because it's the minerals that usually tend to bind to the toxins and then become unabsorbable if we're exposed to those toxins, whereas that doesn't happen as much with the vitamins. I do agree that, in a lot of cases, the minerals are taking the brunt of things.

One of the other issues with minerals is bioavailability. A really good example of this is calcium, the bioavailability of calcium in spinach. So on paper, spinach has 115 milligrams of calcium. That sounds great. Right? It's like, wow, that's over a 10th of the RDA. All I have to do is eat one serving of spinach, and I'm going to

make a big dent in my calcium intake, but then you dig deeper, and you find that the bioavailability of calcium, which means the amount that you will actually absorb when you eat it is only 5%, so you're going to absorb six milligrams of that 115 milligrams when you eat spinach because spinach is really high in something called oxalic acid or oxalate. Oxalates bind to minerals and prevent us from absorbing them.

This is not just true for calcium. It's true for iron and zinc. Plant-based forms of iron and zinc are much more poorly absorbed in the animal forms like heme iron or the form of zinc that occurs in animal products. Most people aren't aware of these differences, and I can't blame them because who's telling them? If their doctor is not telling them we don't get educated about this in school, they naturally just go into the market or look up spinach online. They see the 115 milligrams of calcium, and they make the understandable assumption that they're going to absorb that much of it, but they're not. This is where people get into trouble with all kinds of minerals.

Dr. Wendy Myers: Yeah, because, as you said, it's not what you eat; it's what you absorb. Yeah, the RDA is a huge problem, especially when you're eating nuts that have tons of phytates. Yeah, you're just not getting everything on that RDA label, for sure.

Chris Kresser: Yeah, and the RDA itself is inadequate. That's another thing that most people don't realize. The RDA was originally developed in World War II as a means to determine the daily intake of a nutrient that would support soldiers and would basically keep soldiers from developing deficiency-related diseases.

Dr. Wendy Myers: Just keep them alive. That's all that was required.

Chris Kresser: Yeah, wartime here. We're not talking about what's optimal for long-term health and longevity. We're talking about, yeah, what's required to keep them alive and able to function and perform during a wartime environment. Most people don't realize that about the RDA, and certainly, the RDA has been updated over time, but it often doesn't take into account factors like health status. As I said earlier, people who are sick tend to need more or have a chronic disease tend to need more nutrients. It doesn't take nutrient synergy into account. For example, vitamin D actually requires the presence of magnesium to be activated, so even if you're getting enough vitamin D from the sun or food or supplements, if you're magnesium deficient, you won't actually. Your biological activity of vitamin D will still be low, and that is true for almost every nutrient. They require other nutrients to be properly absorbed and utilized, and the RDA doesn't take that into account at all. If you're meeting the RDA for a particular nutrient, then it's like, okay, great, no worries, but if you're actually deficient in some other nutrients, then even meeting the RDA for that nutrient won't be enough.

Then the last thing is these RDAs are just often out of date. Magnesium is a really good example. There was a paper published in 2021 by some researchers who noted that the RDA for magnesium is strongly influenced by the average

body weight. If you look at the mathematical formula for calculating the RDA, it includes a number for the average weight of the average adult male and the average adult female. Well, the last time that the RDA was updated for magnesium, the average body weight for an adult female was 133 pounds, and the average body weight for an adult male was 166 pounds. Today, the average body weight for a female is 169 pounds, and the average body weight for a male is 196 pounds, so that's a profound difference in a short period of time.

When they recalculated the RDA for magnesium, it went from 320 milligrams a day for women to about 500 milligrams a day. For men, it went from 420 milligrams a day to about 600 to 650 milligrams, so this is another example where you could look up the RDA on Healthline or some site like that and be like, "Oh, okay, 320 milligrams. I'm getting that," not realizing that the RDA actually now should be 200 milligrams a day higher. Even with that, most people are still falling short of that outdated RDA, not to mention the new updated RDA. There are so many problems that aren't obvious just on the surface that when you dig a little deeper, you see what kind of situation we've gotten ourselves into.

Dr. Wendy Myers:

Yeah. I'm sure there are a lot of nerds listening that is calculating all this stuff on their diet. I used to be one of them. I used to be like, "Oh," looking at all the labels and what I was getting. I used to take a huge bag of supplements, just like a grocery bag full of supplements. I ate all my food from the farmer's market, all organic, all fresh, cooked it at home, and I still had nutrient deficiencies. I did a nutrient eval. I was blown away. I was like, "What exactly is it that I need to do?" At that time, I had been vegetarian for about 18 months and was starting to have health problems and a big surprise, but even with all the effort and concentration, I still had a lot of nutrient deficiencies.

Chris Kresser:

Yeah. Again, it makes me sad to say this because I wish it was different. I wish that we lived in a different world where you could put that effort in and you would be assured of success, where you eat nutrient-dense food, and that's it. To be honest, Wendy, it took me a while to accept it. I feel like much earlier, 10 years ago, I was in denial for maybe a year or so where I was just really sticking to my guns that we should be able to meet all of our nutrient needs from food. The operative word there is should. I still believe that we should be able to in an ideal world, but I just couldn't keep believing that anymore.

As you know, as a clinician, we learn so much from our patients, and just doing one nutrient deficiency test after another kept coming back with multiple deficiencies, even in people who are doing all the right things, reading the scientific literature, pretty much every paper that has come out over the last 10 years on nutrient status and nutrient deficiency, training thousands of clinicians from over 50 countries around the world, seeing that this is a problem everywhere, in the US, the UK, Canada, China, Australia, New Zealand. It's the same story everywhere. I just could no longer maintain the fiction that we can meet all of our nutrient needs through food.

Then once I accepted that, I started trying to answer the question, "Okay, well, what do we do with this information? What's the best approach for most people?" I still believe that the foundation should always be a nutrient-dense diet. I'm not one of these people that thinks we should drink Soylent green nutrient-fortified beverages like some people in Silicon Valley in the computer world. I think we should get almost everything we can from food, basically, but I recognize that that's not enough in the case of many nutrients.

We're not perfect, either. Most of us live a pretty fast-paced life or a life that involves other obligations, friends, family, work, and other interests. We're not in the kitchen all day, every day, preparing our own food in most cases. There are inevitably areas where we're going to fall short, so rather than beat ourselves up about that, my approach is let's recognize the reality of that and create a strategy that can actually help us to mitigate those downsides of modern life.

Dr. Wendy Myers: Yeah, so what is your strategy? What are the most nutrient-dense foods that people should eat?

Chris Kresser: Yeah, so this might surprise some folks and might disappoint some folks because, in a lot of cases, they're not including a lot of these foods in their diet, but the best answer to this question comes from a paper that was published in March of 2022 in the journal, *Frontiers in Nutrition*. The author was Ty Beal, who works on the Knowledge Leadership Team at the Global Alliance for Improved Nutrition. That's an organization that's dedicated to addressing malnutrition worldwide, so the question they were trying to answer is, where do we get the biggest bang for our buck from food, from a nutrient density perspective? Because if you work for an organization and your job is to figure out how to address malnutrition, you have to be very practical. You have to think about what foods we could give people that are going to rapidly and effectively increase their nutrient levels with the least amount of effort and the lowest cost?

They created a scale of nutrient density that ranked foods according to the number of calories or grams needed to provide one-third of the RDA for vitamin A or retinol, the active form of vitamin A, not beta-carotene. Folate, which is B9. Vitamin B12, calcium, iron, and zinc. They were specifically focusing on women of reproductive age because that is the group that is at the highest risk of nutrient deficiency worldwide, so two things about this study before I go into the numbers. One is that it was the first study of this that ever took bioavailability into account. As we just discussed earlier, that's hugely important because otherwise, you could see spinach way high up on the scale without realizing that you're not even going to absorb most of those nutrients that it contains on paper, at least the minerals.

The second thing is that because of the way they created the scale, it's looking at the number of calories and grams of food you need to meet a basic nutrient

threshold, so a lower score is actually going to be better or indicate a higher nutrient density. For example, you only need to eat 11 calories of the liver, which is a minute amount to get to that nutrient threshold that they define, so the liver is by far the number one most nutrient-dense food according to the scale. It had a score of 11 calories. The next food, which I can guess that precisely 0.001% of your audience is eating, may be less than that, is the spleen.

Dr. Wendy Myers: Ew, delicious.

Chris Kresser: Yes, spleen, and that's 62. Even as nutrient-dense as the spleen is, it's still five times less nutrient dense than the liver. That's not a knock on the spleen. It's just another testament to how incredibly nutrient-dense liver is, so the liver king, that whole drama, that's a mess, but he's not wrong about the liver and the power of the liver. The next one is small dried fish, so those are anchovies and sardines that, in this case, were dried, so the nutritional value is concentrated. That's not a common food in this country, but it is around the world, so they included that.

Dr. Wendy Myers: Cats in the US eat a lot of those.

Chris Kresser: That's true. That's true. Dark leafy green vegetables. We mentioned some of the bioavailability issues with some of the minerals with things like spinach, but kale, chard, and some other dark leafy greens are actually fairly low in oxalic acid and are a very good source of nutrients. Bivalves like oysters are at 90. Beef kidney, 125, another organ meat. Beef heart, 163, another organ meat. Crustaceans like shrimp, 193. Goat, beef, eggs, and milk, so are the top 11 foods. What the biggest surprise is, I think, for most people on this list is that there was only one plant food in that top 11 foods from a nutrient-density perspective. I do want to point out that this was just measuring those essential vitamins and minerals like A, B12, folate, calcium, iron, and zinc.

It was not measuring phytonutrients. Those are things like polyphenols, flavonoids, carotenoids, fiber, and these foods are important to our health, I believe, so I'm not suggesting that people should only eat animal products. I'm not a believer in the carnivore approach in general. I think it has some value, but that's not what I'm saying here. I'm saying when it comes to the essential vitamins and minerals, the foods that I just listed are objectively speaking. This is not an opinion. This is a research study that was peer-reviewed using the most recent validated methods for measuring nutrient levels. From a bioavailability perspective, those are the foods that are most nutrient dense.

Dr. Wendy Myers: Okay, fantastic. Yeah, and I think speaking to that, what are some of the issues with vegetarian and vegan diets, in your opinion?

Chris Kresser: Yeah, so if we go back to Dr. Bruce Ames and what he said about what the goal should be for the diet, he said it's maximizing your intake of all of the different nutrients that we need. We can think of those nutrients in two different classes.

One is the essential vitamins and minerals. By essential, that has a very specific connotation in this context. It means we can't live without them. We will develop serious diseases and even die if we don't get enough of them, and it means the body can't make them on its own, so we actually do need to obtain them from the diet. Those are the vitamins and minerals everybody is familiar with. B12, iron, zinc, vitamin A, vitamin D, vitamin K, et cetera. Those are preferentially found in animal foods. In some cases, they're exclusively found in animal foods, so if you eat a completely plant-based diet, you have to account for that in some way or another.

B12 is a good example. There are often claims made in the plant-based diet community that you can get B12 from spirulina and yeast and other foods, but that's not true B12. It's an analog of B12 that doesn't have the same effect and, in fact, can even block the uptake and absorption of true B12. So, the more people who've been on a plant-based diet are educated about that, take action accordingly. They take a B12 supplement because they know that they have to meet that need for B12 some other way. They're not going to be able to get it through the diet. It's not just true for B12.

There are other nutrients like iron. Iron is found in plant foods, but it's absorbed much more poorly in plant foods than it is from animal foods. Heme iron has a much greater absorption rate than ferrous iron in plants, so vegetarians are at high risk of iron deficiency. They're at high risk of zinc deficiency for the same reason. They're at a pretty high risk of not getting enough EPA or DHA, which are the long-chain omega-3 fats found in seafood. A lot of vegans will take a DHA supplement that's derived from algae, so those are the biggest nutrients of concern on a vegetarian and vegan diet.

Is it possible to follow those approaches and supplement wisely and make it work? Absolutely, and some people are able to do that, but the risk is high of those kinds of nutrient deficiencies, and that's documented in scientific research. Also, it's been true in my clinical practice. I've treated a number of vegans and vegetarians, and it got to the point where I could recognize what I would call a fingerprint or a thumbprint of a blood test from a vegetarian or a vegan.

In fact, in our model, the way we structured new patient visits, I would see lab work for somebody before I actually saw them on my first visit with them, so it became an interesting intellectual exercise where I could look at lab results without knowing anything about the person who I was going to see in a few weeks and basically guess what their diet was from the lab results. You could see a very clear pattern between vegans and vegetarians with the lab results.

The second category of nutrients, though, because now I hear all the carnivore diet advocates nodding their heads and cheering and saying, "See, I told you," but I'm going to flip over here and say there's a whole other category of nutrients that are not essential, to be fair. By essential, we mean you can't live

without them. You're probably not going to die, at least not immediately. These are phytonutrients, and even one essential nutrient, vitamin C is almost exclusively found in plant foods. There is vitamin C in the adrenal glands. Again, I'm going to go out on a limb and guess that very few of your people listening to this show are eating adrenal glands on a regular basis or even taking them as a supplement. So vitamin C, you're mostly getting from plant foods.

Then you have carotenoids like lycopene, beta-carotene, lutein, zeaxanthin, disulfides, which are from the allium class of vegetables like garlic, polyphenols, flavonoids, lignans, plant sterols and stanols, prebiotic fibers, et cetera. These are mostly, if not exclusively, found in plant foods. There's a lot of research over the past three decades, especially that attests to the health benefits of these foods. They can upregulate our antioxidant defense system. They can help protect us against chemicals and toxins in the environment. They have a whole range of benefits.

I believe for this reason that if we're trying to maximize our intake of all of the different nutrients that have been shown to be beneficial to health, we need to eat some combination of plant and animal foods. What that exact combination is and how that ratio breaks down, I think there's actually a lot of leeway for individual preference or specific needs based on health conditions or whatever. We have examples of cultures traditionally that ate a very high percentage of their calories from animal foods and just a little bit of plant food, and they were healthy. We have examples of the opposite where people ate mostly plant foods but carefully selected animal foods like organ meats or shellfish, and they were healthy, too, so I think there's a lot of flexibility there.

Dr. Wendy Myers: Going back to organ meats, how can people get more organ meats in their diet? I definitely recommend liver supplements for almost every patient that I'm working with our practitioners are working with because it is so nutrient-dense and mineral dense.

Chris Kresser: Yeah, so there are a few different ways. I mean, first of all, if you are one of the few people that are fortunate enough to have eaten organ meats when you were growing up, and you actually like the taste and the texture, just beef liver and onions, for example, is a great way to eat it. If you're like most people and you don't care for the taste and texture, there are a few different tricks or ways to make it easier.

One that I found that is pretty easy and not very time-consuming from a preparation standpoint is, let's say, you're going to make ground beef for something like a meatloaf or taco beef or something like that. You get a couple pounds of ground beef. You mix in whatever seasonings you want to make. Preferably for this use, you are seasoning it because you're trying to conceal, to some extent, the taste of liver. Then you get three ounces or six ounces of the liver. Chop it up really finely, mix it around in the ground beef, and then with the spices. A lot of people actually don't mind it that way, and they're able to

tolerate it. It disguises both the taste and the texture pretty well, making it a little bit easier to eat.

Another option would be pate. I call it like a gateway organ meat because a lot of people did grow up eating chicken liver pate or other forms of pate. Just the way that it's made is a little bit easier for people to tolerate, even if they don't love organ meats. There are several other examples of cultures that consume organ meats in specific ways, so like sweetbreads. US Wellness Meats sells some different pre-made types of organ meats, like charcuterie type of stuff, so those are generally the best options for people who don't care to prepare it or don't care for the taste.

Dr. Wendy Myers: In Texas, we can put it in chili. There are so many spices in chili you can add there. You won't even know. What do you say to some of the listeners concerned about toxins being in the liver since the liver processes all the toxins and there is toxic residue in the liver and liver supplements?

Chris Kresser: Well, it's true that the liver processes the toxins, but the fat tissue tends to be where toxins are stored, so I would be more concerned actually about somebody from a toxins perspective consuming fat from conventionally raised dairy animals, so like milk products or butter or ghee or really fatty cuts of meat like chuck roast or oxtail or brisket. I really, really recommend people get pasture-raised beef or preferably organic beef if they're eating those fattier cuts or portions of the animal because that's where the toxins are stored. Whereas they are processed in the liver and go through the liver but usually end up in the fat tissue. We've done testing on organ meats in the past, and we tested our organ supplement, and we have not found significant amounts of microbial residue, heavy metals, or other toxins, so it's not a big concern for me.

Dr. Wendy Myers: All right, fantastic. When it comes to supplementation, people are trying to get the nutrients they need, so what nutrients should people be careful supplementing with?

Chris Kresser: Yeah, that's a great question because you can get yourself into trouble here. There are some nutrients that need to exist in what we might call a Goldilocks range. You don't want too little, and you don't want too much. There are other nutrients that, as far as we know, don't really have an upper limit in terms of toxicity, but you might find yourself running to the bathroom. For example, vitamin C, there's no known upper limit when it comes to toxicity, but if you take enough vitamin C, you're going to have diarrhea, and that will be a sign that you've overdone it and taken too much.

Dr. Wendy Myers: Yeah. I've had a number of clients email me in panic.

Chris Kresser: "Oh, my God, what have I done?"

Dr. Wendy Myers: Even health practitioners because people just don't. They don't realize.

Chris Kresser:

Don't realize that. Yeah, but there are nutrients where there is actually a significant risk of overdosing. Calcium is one that I mentioned. There are studies that suggest if you take too much calcium, you can increase the risk of kidney stones and soft tissue issues. Selenium, you can definitely overdo it. There are clear studies of selenium toxicity in the scientific literature. Vitamin A or retinol, you can overdo and get too much. Vitamin D, you can overdo it. I think it's pretty rare, but I've seen people with toxic levels of vitamin D in their blood, like 125 or 150 even, which is scary because it really can affect calcium deposition, cause calcium deposition in the arteries and soft tissues, and can increase the risk of kidney stones. Iodine can be problematic for some people, particularly those with Hashimoto's or autoimmune thyroid conditions. High doses of iodine, especially if they're selenium deficient as well, can be an issue, and then iron. Iron overload, the genetic condition that causes iron overload, hemochromatosis, is fatal if it's not treated in some cases, so that gives you an idea of how serious excess iron can be.

Having said all that, it's much more difficult to get yourself in trouble from food than it is from supplements. With supplements, one of the reasons that we've formulated the multi the way that we did, we didn't include iron at all. Iodine we didn't include. We have a very low dose of calcium at 50 milligrams; exactly for this reason, we're selling a product to people who are following all kinds of different dietary approaches. We don't know what their background intake is like, so we want to be conservative with the nutrients of concern so that if someone's eating a very high calcium diet, they're not going to get 500 milligrams of extra calcium from our multi and push themselves over the edge. So there are some nutrients that it's best to take a more custom, individualized approach with and then others that are just safer because the threshold for toxicity is so high that most people are not going to ever reach it in a normal day-to-day diet.

Dr. Wendy Myers:

Yeah, tell us about your supplement line, Adapt Naturals.

Chris Kresser:

Yeah, so this came out of 15 years of clinical experience treating patients, training practitioners, and health coaches, my own research, and my own experience of chronic illness. It's really the culmination of all of that experience. As we talked about earlier, once I realized how big of a problem nutrient deficiency is and how many people it affects, before I knew that, there was the little tip of the iceberg sticking out. Then over time, I got visibility into just how big that iceberg was underneath the surface. I wanted to figure out a way that could just help a much broader number of people than I would ever be able to see in the clinic as a clinician or even impact other clinicians that I was training.

That's how Adapt Naturals came about, so it's a line of supplements that is designed to add back in what the modern world has squeezed out, all of the challenges that we talked about before. The ingredients are naturally occurring, bioidentical, food-based, or as bioavailable as possible. They're evidence-based,

with lots of peer-reviewed research behind them, and high-quality GMP manufacturing. I just wanted to create products that people could trust because, let's be honest. There's a lot of BS in the supplement world. There are a lot of companies that are in it just to make money. There's a lot of really shady stuff that's happening. I just wanted people to have products where they knew they could meet their nutrient needs, and they could just trust them and not have to spend hours every day researching to try to figure it out on their own.

Dr. Wendy Myers: I just cringe when people put they are taking vitamins from the drug store, from the-

Chris Kresser: GNC?

Dr. Wendy Myers: Yeah, or from their membership store. I'm like, "Oh, God. You're doing so much more harm than good," or there are so many binders in those that are binding it to keep it in that pill form that they just poop them out just whole. They're not getting anything at all.

Chris Kresser: Yeah. I've always asked all new patients who came to see me in practice. I would have them bring all the supplements that they're taking in a bag. Of course, some people show up with a second carry-on suitcase with their supplements because they're taking that many. I was, as I'm sure you have been, Wendy, just shocked and dismayed by what people would bring in. Again, I don't put the blame on the individual people because it was often from the guidance that they had received previously from another doctor or another clinician or something they read, someone they follow online or on social media, or whatever. There's so much conflicting information out there. It's hard for even healthcare professionals to make sense of much fewer lay people who don't have the training and aren't able to critically deconstruct the claims that are being made and see through some of the nonsense.

Yeah, I would frequently see examples of where people were actively harming themselves and had been for years with supplements. Or, on the flip side, as you said, people were just wasting money because they were taking supplements that had such low levels of nutrients or in a form that was not bioavailable and not likely to be absorbed. It's sad because I think, actually, if you do it right, you can greatly minimize the number of supplements that you're taking, and you can spend less money as a result. You take a handful of products that are really high quality, and you end up spending less and taking fewer products than if you're taking a bunch of different stuff with inferior ingredients.

Dr. Wendy Myers: For sure, less is more. Unfortunately, right now, supplements can be pretty expensive. Prices are going up for a lot of things, but you're better off taking a handful of the higher price supplements that are higher quality than a bunch of low-quality ones. I've had clients send me spreadsheets of the supplements that they're taking, and it's just too much. If you're taking it like me, in the beginning, I had a whole shopping bag full of supplements. It's too much. If you're not

hungry after you take all your pills, it might be a problem. You don't have room for your meal.

Chris Kresser:

Yeah, and we don't want to be there. That's why if you think about what the word supplement means, it means adding to something. You're supplementing a healthy, nutrient-dense diet. If you're doing it well, you should be able to get by with fewer products. With Adapt Naturals, we have the Core Plus Bundle, which is a daily stack of five products. It's specifically designed with that in mind. You're not going to be surprised to learn that one of them is an organ supplement. Why organs? Well, I explained it earlier. Of the 11 most nutrient-dense foods, four of those are organs, so we have those four organs in the supplement along with the fifth, the pancreas, which has a unique nutrient profile. We have a full gram of liver and 500 milligrams of the others because the liver, as I mentioned, is so much more nutrient dense even than the other organ products. If you take an organ supplement, it's equivalent to eating one or two servings of those organ meats a week, and you're getting that incredible nutritional benefit without having to eat or prepare them, so you can get so much bigger bang for your buck by doing that than by taking a bunch of different isolated products.

We have a mushroom blend. I've been a huge believer in the healing power of mushrooms for almost 20 years because I originally, way back in the day, studied Chinese medicine. Mushrooms have been used in Chinese medicine for over 3000 years. At least 3000 years that we know of, possibly longer, and also in other traditional systems of medicine like Ayurveda and most traditional healing systems. It's interesting because it's only recently that modern research has caught up and has started to elucidate all of the incredible health benefits of mushrooms, but it's another food-based naturally occurring set of nutrients that most people are just not eating a lot of mushrooms and particularly not the most nutrient-dense therapeutic types of mushrooms because some of those can be pretty bitter and chewy and not easy to eat. Reishi is a good example. It's an incredibly powerful mushroom, but you don't really want to eat it or use it in your cooking for the most part.

Then we have a magnesium product because the vast majority of people are deficient in magnesium and don't get enough, and it's used in over 700 different enzymatic reactions in the body. We have a multi that's really more of a primal or ancestral type of multi with just food-based naturally occurring ingredients for the most part. Then a unique form of vitamin E called tocotrienols which are much more potent as antioxidants and much more potent as an anti-inflammatory than tocopherols. The idea is just to give people a simple, easy routine to follow every day where they can feel and perform their best, not have to stay up spending hours doing internet research, just high-quality ingredients they can trust and get back to living the life they want to live so that their health is actually supporting that rather than getting in the way of it.

Dr. Wendy Myers:

Yeah, and that natural form of vitamin E you mentioned is so important for detoxification and your liver health, and it's just not found anywhere. I mean, it's

very rare. Usually, you see the synthetic form of vitamin E, which is not helpful, and you need that for detoxification. It's so important.

Chris Kresser: Yeah, and the reason that most companies use tocopherols in their products is it's a lot cheaper. I'm not going to lie. Tocotrienols are more expensive, and they're more expensive for me to make the product, so the products when you take them will be a little more expensive because we obviously have to charge more if we're paying more for the raw ingredient, but it's worth it for two reasons. Number one, as you said, vitamin E is one of the most potent antioxidants that we know of. It is the most potent antioxidant in the brain, so for anyone concerned with brain health and cognitive function, reducing their risk of dementia and Alzheimer's, Parkinson's, and neurodegenerative conditions, vitamin E is critical.

I mentioned earlier that 89% of people don't get enough vitamin E, so it's a very, very important nutrient. The other problem is, as I'm sure you know, Wendy, there were some very concerning long-term studies of supplementation with the tocopherol form of vitamin E, the more common form that showed an increased risk of prostate cancer and cardiovascular disease. That is not observed with tocotrienols, which are this relatively newly discovered form of vitamin E that we're talking about now, so it's a much safer form to supplement with, and it's a much more potent form.

Dr. Wendy Myers: I love how these nutrient studies come out on CNN and all these, the big newspaper outlets, steering people away from supplements where the form that they're using in the study is terrible. It's a synthetic form or petroleum based or what have you. These are the forms that are prevalent in most vitamins that are sold in drugstores and membership stores.

Chris Kresser: It drives me nuts. I'm sure it does for you, too. It's like saying, "Study shows that food is not good for you."

Dr. Wendy Myers: Exactly.

Chris Kresser: Okay. Well, wait. What kind of food? Where is the food grown? How much of the food are we talking about? Grouping supplements into one category like that is just meaningless and stupid, frankly. If anyone sees an article like that, you can just dismiss it out of hand because you can be assured that the person writing that is not sophisticated or educated enough to be able to differentiate between different types of supplements. Yeah, that's absurd and, fortunately, is relatively easy to dismiss. I wish for people. Most people are just seeing those headlines and keep scrolling, and they're not actually asking those questions, but yeah, anytime you see an article like that, that's the response.

Dr. Wendy Myers: Yeah, I love how on your podcast on Revolution Health Radio, you take these studies that are coming out on the headlines and really pick them apart and just shred them and give real concrete advice based on the evidence, studies that

are done by the better form of the nutrient because the specific form of each nutrient really, really matters.

Chris Kresser:

Yes, it absolutely does. The devil is in the details, as they say, and we've already covered several examples of that where the calcium in spinach versus calcium in more bioavailable forms or folate versus folic acid is much more bioavailable and less likely to cause problems. You really have to understand the nuance to get the most out of your nutrient strategy. I hope that one of my goals with Adapt Naturals was just to make that easier for people since most people don't want to spend, understandably. That's not their background, their training. They don't like to geek out and read nutrient-density studies as I do. That's my job. Let me take care of that, and you do you, so to speak. We don't all need to be experts on that to live a good life.

Dr. Wendy Myers:

Yes, and what about fiber? This is something a lot of people are taking. Let's talk about fiber in general, maybe some specific types like beta-glucan.

Chris Kresser:

Yeah, so this is a very controversial topic. It's not in the conventional medical world. In conventional medicine, it's universally agreed that fiber is good and more fiber is better. Then you have the other end of the spectrum, the carnivore crowd that says fiber is not only not necessary, but it's also actually harmful. I'm somewhere in the middle. I think fiber is really important. If you look at traditional cultures around the world, they generally had higher fiber intake than we have today. I think there is a lot of research that shows that soluble forms of fiber or types of fiber that are fermentable by our gut bacteria can produce short-chain fatty acids like butyrate and many other compounds that are really beneficial to our health. We're only scratching the surface of that research now.

Again, my preference is to get as much fiber as possible from my diet. That's always the best source, I think, but then there are some unique types of supplemental fiber that have additional benefits above and beyond what we might be able to obtain in a normal diet. You mentioned one of the biggest ones, which is beta-glucan. So this is a type of fiber that's found in mushrooms primarily but also in some grains like oats, but the type of beta-glucan in mushrooms is a little different than the type in oats and is more therapeutic.

A Japanese scientist who is perhaps the global expert in beta-glucan. I'm forgetting his name at the moment, but he calls beta-glucan biological response modifier. What he means is that it powerfully activates and regulates. Not necessarily stimulates because you don't necessarily want something that's just stimulating the immune system all the time because that would lead to allergies or autoimmunity, or any number of other problems but regulates the immune system so that it increases our defense against pathogens, infections, bacterial, fungal and viral infections, but it can also actually put the brakes on an autoimmune response. It can help our protection against environmental toxins, so it basically improves the biological response of our immune system. Beta-glucan also has been shown to lower cholesterol levels and improve lipid

markers. It has a blood pressure-lowering effect. It can lower blood sugar, and improve insulin, a whole wide range of benefits that are, again, only starting to be fully understood, although we now have a few decades of really compelling research.

Dr. Wendy Myers: Well, Chris, thanks so much for coming to the show. Where can we find more info about you and your website and learn more about your supplement line?

Chris Kresser: Yeah. Thank you, Wendy. My content site is chriskresser.com. I've been doing this a long time, so we have about 1300 free articles on the site, 17 eBooks, I believe. Podcast Revolution Health Radio, so lots and lots of free information there if you want to dive deep into these topics. Then the supplement site is adaptnaturals.com. You can learn more about our products there and place an order if they seem like a good fit for you. Thanks again for having me on the show, Wendy.

Dr. Wendy Myers: Yeah, thank you so much, Chris. I've been following you for a really long time, and I trust the content on your website implicitly. I mean, you have just incredible research and a vast depth and breadth of knowledge, so your content and everything on your website are just bar none. So all my listeners, I highly recommend you follow Chris on his podcast and his website. It's really amazing information.

Chris Kresser: I really appreciate that, Wendy, and keep up the great work. I'm looking forward to our future conversations.

Dr. Wendy Myers: Yes, yes. Everyone, thanks so much for tuning in to the Myers Detox Podcast. I'm Dr. Wendy Myers, and it is such a pleasure every week to bring you experts from around the world to help you to upgrade your health. I just hope this show gave you just a couple little nuggets that could help you put that piece of the puzzle for your health together, so thanks for tuning in. I'll talk to you very soon.