

# The Paleo Solution

## Episode 69

Andy Deas: Robb Wolf, Andy Deas, back with episode 69, The Paleo Solution. And today we are joined by Chris Kresser. What's up, guys?

Robb Wolf: Chris, how are you doing, man?

Chris Kresser: I'm good. I'm enjoying the sun again I have to say. I'm a spoiled Californian, but can I do about it? It's in my blood.

Robb Wolf: Oh, dude, I will bitch at the first day of cloud in California. The whole state can dry up, and we just need to extract water out of the air and yeah.

Chris Kresser: I'm with you. My wife is Canadian. She looks at me like I'm crazy when I complain after two days of rain. She's like, "What do you mean? It's barely even started."

Robb Wolf: Yeah. Well, we were just talking about this before we pressed record that the Canadians are just wired up differently as was evidenced by Matt Lalonde last week.

Chris Kresser: I can attest to that.

Andy Deas: Anyone that could send scientific references like that, Robb, we'll have anytime. Anytime he wants us to wake at 6:00 a.m. and record conference calls, we'll do it.

Robb Wolf: That's true. That's true. We're in.

Chris Kresser: What about you guys?

Robb Wolf: We went and did a little bit of traveling and just got back and glad that the weather is good. That's about it. Andy looks taller and swarthier than the last time I saw him. I don't know if that's possible but...

Andy Deas: Robb, I had a client today who I've only been training for about a month - two, a woman in their 50s. She's like, "Did you always have a beard?" And I'm like, "You mean for the past month?" And she's like, "Yeah." I'm like, "Do you not pay attention at all to what we do in the gym. I've always had a beard."

Robb Wolf: She probably just has really bad eyesight. She's only been able to focus on like your mid-sternum area.

Andy Deas: She's not tall. She's concerned about us cutting out two major food groups though. She's the one that commented that the health of the gym was at risk because we cut out food groups.

Chris Kresser: Uh-oh.

Robb Wolf: Is that the Twinkie and the breakfast cereal food groups?

Chris Kresser: Right, those, yeah.

Andy Deas: Those are my two favorite after I watched those guys on Epicmealtime.com, deep fry the Ho Hos and Ding Dongs and make that crepe.

Robb Wolf: Dude, it's genius. Chris, if we fry the gluten hard enough, it will kill it, right?

Chris Kresser: Oh, yeah, that's right. That's right. Definitely. No worries there.

Robb Wolf: Perfect.

Chris Kresser: Actually, you got to add -- you got to use the highest omega-6 seed oil you can. I heard that works really well.

Robb Wolf: Perfect. And pumps some oxygen through it with a little bit of a platinum catalyst just to make sure we hydrolyze it all.

Chris Kresser: Even better. And then bread it in flour, of course.

Robb Wolf: Cool. I'm in.

Chris Kresser: That's good.

Andy Deas: Robb, I wanted to mention, I got a random email from a guy I went to high school with, on Facebook. He was like, "I started to listen to your podcast." And he's like, "Robb is a little over your head, but you guys are really funny." So, you know.

Robb Wolf: Obviously, he doesn't get out much.

Andy Deas: I know. He's an attorney. So he --

Robb Wolf: There you go. He just deals with angry people all the time.

Andy Deas: Exactly. Exactly. So Robb, I'm supposed to remind you that you may want to say something about Paleo Brands.

Robb Wolf: Oh. I'm not sure what to say about it so, Paleo Brands. Buy some food. We have good jerky. So buy some cookies.

Andy Deas: Performance art that's all it is.

Chris Kresser: Dude, you're quite the salesperson, Robb.

Robb Wolf: Yeah, totally.

Andy Deas: I know. We don't suck.

Robb Wolf: Yeah, Paleo Brands. It doesn't suck much.

Andy Deas: Robb, is there anything else you want to talk about before we get to Chris.

Robb Wolf: No. We need to introduce Chris and actually get some qualitative content on this thing before people start tuning out.

Andy Deas: All right. Well, I thought for folks maybe that don't know Chris, Chris could give us a little bit of background, kind of his story. I know there's a lot of stuff in there about the Indonesian illness and Zen meditation, et cetera. And then Robb, maybe you could chime in about how you bumped into Chris and kind of how we got to this point because all I know is I get this email, like "Hey, we're going to have Chris Kresser on the podcast." And I'm like, "Awesome! Who is Chris Kresser? I better go look."

Robb Wolf: Chris, tell all six listeners who the heck you are and how you -- the unfortunate set of circumstances that brought you to sharing that booth with Andy and I.

Chris Kresser: All right. Well, let's see. I have an integrated medicine practice in Berkeley, and I also worked with people around the world via phone and Skype. I was -- I did my training as an acupuncturist and herbalist, but I practiced what I like to call "investigative medicine," which means I focus

on determining the underlying cause of the problem and addressing it in that level instead of just chasing after symptoms.

So I specialize in working with patients who have been struggling with chronic complex illness, who haven't been able to find help anywhere else. And I do western modern lab testing and some traditional diagnostic stuff. And then I use dietary changes, you know, Paleo type of diet plus botanical medicine, supplements and lifestyle changes to restore function. So that's what I do.

And how I came to this, well, that's a long story; but the short version is in my early 20s I did a lot of traveling, and I spent a lot of time in Indonesia and Southeast Asia surfing and -- mostly surfing. And I was in a village on Sumbawa, and I got super sick, the classic tropical type of illness that you hear about coming out of both ends and delirious, didn't remember anything for three days or just completely blank.

Luckily, some other guy there had some antibiotics in his kit and who knows, that might have saved my life. And then I was fine for about six months after that. I was still traveling, and I just started to get sick again. And I couldn't -- I went to doctors, came back to the States, went to several different doctors. They all thought I had parasites. They gave me Flagyl.

I took the drugs. I didn't -- I'd get better for a little while, then I would get worse. And I just started this long, long several year process of trying to figure out what the heck was going on. And in that process I just started to educate myself because I realized that there wasn't anybody else that was more interested in me getting well than me.

Robb Wolf: Sure.

Chris Kresser: And I also realized that a lot of the comment -- the sort of typical things that I had learned about health and nutrition are just flat-out wrong. And so I just went back to school. I studied Chinese medicine and started doing my own research, and one thing led to another and here I am.

Robb Wolf: Nice. And I think I was introduced to Chris via Diane Sanfilippo of Balanced Bites, and I think she went to one of your talks. Is that the first time you guys met or...?

Chris Kresser: I don't think she's been to a talk. I don't actually remember where we met, but we've seen each other at a couple of Dr. Kharrazian's lecture.

Robb Wolf: Got you. Okay.

Chris Kresser: And we just hooked up, sending emails back and forth just talking about gluten and dorking out on all those stuff like we do.

Robb Wolf: Right.

Chris Kresser: Oh, yeah, we had -- we got together over a year. We had some tea together and just got to know each other which was great. She's fantastic.

Robb Wolf: Yeah. Diane is awesome. She's totally a bad-ass in this whole thing, and I think, Chris, our first phone call was about two and a half hours or something like that. We hit it off pretty good right off the bat. So I finally got to meet you. I got you on the podcast and everything. And now, you have your own podcast rolling now.

Chris Kresser: Yeah. We did -- I did like a couple of them about a year ago, and then it -- I was just too busy with finishing school, and so it kind of lagged in the background for a while. And then we just did our first episode. We recorded another. So it's going to be pretty regular every -- once -- twice a month I think for a while and see how that goes.

Robb Wolf: Where can people track that down?

Andy Deas: That's at [thehealthyskeptic.org](http://thehealthyskeptic.org), which is my blog. And just click on the podcast button in the navigation bar. It's also in iTunes, if you're an iTunes subscriber.

Robb Wolf: Cool. So obviously, an opportunity to listen to something much better quality than this show.

Chris Kresser: I don't know about that. Robb, I got to tell you, my wife is pretty happy that we've met because she's getting tired of me talking about gluten for two hours.

Robb Wolf: And I'm not sure how meeting me will mitigate that when I'm pestering you on something like, "Chris, do you have this paper? Have you read this thing?"

Chris Kresser: The point is I'm not talking to her about it so that's something more.

Robb Wolf: Oh, perfect. Kind of like finding a kid down the street who has the same --

Chris Kresser: That's right.

Robb Wolf: -- that you have. It's like --

Chris Kresser: That's right.

Robb Wolf: "Hey, cool."

Chris Kresser: All right. So we should get to it before people get angry with us.

Andy Deas: Well, I want to know about your Zen meditation practice.

Chris Kresser: Okay.

Andy Deas: Because that's something that I would geek out on talking about that.

Chris Kresser: All right. I actually got introduced to meditation by my dad which is not the normal route I guess, but he was doing it for stress reduction mostly. When I was about 17, he turned me onto it. That wasn't Zen at the time, it was transcendental meditation. I don't know if you guys have heard of that. That's a whole --

Andy Deas: Oh, yeah.

Chris Kresser: That's a whole another story. But it was a starting place for me, and it was good. I got to experience the benefits of meditation practice and then got involved in Zen practice. And I have been a formal student of Zen for the past several. Actually, my teacher, Darlene Cohen, just passed away a few weeks ago. So that's a big change for me. But yeah, it's been a big part of my life and a big part of my healing process, a big part of the way that I worked with chronic illness myself and a big part of how I work with patients.

So mostly for me it boils down to learning to stay present with whatever is happening without too much reactivity. And that can be a pretty important skill when you're dealing with some heavy physiological or even emotional or psychological symptoms.

Robb Wolf: Art DeVany had some really nice writings on kind of a Zen approach -- an interesting wedding of kind of the Zen philosophy and Paleo evolutionary biology type concepts. So it's an interesting thing. You see a lot of that same kind of flavor floating around, like, people seem to aggregate with these different concepts. So it's pretty cool. Yeah.

Chris Kresser: Yeah, I should check that out. I haven't seen that.

Robb Wolf: Yeah.

Andy Deas: Plus he's taller than Robb so, you know --

Robb Wolf: Dude, everybody is taller than I am. I'm like Herve Villechaize.

Andy Deas: Somebody sent me an email, Robb. Totally off the subject that Welbourn should come back on or all our guests and we should just spend an hour making fun of you. Apparently, that's a very popular topic.

Robb Wolf: I'm an easy target.

Andy Deas: So Chris, next time you're on you could think of some jokes at Robb's expense, and then we'll -- you've been warned. We're prepared.

Chris Kresser: All right. Got it.

Andy Deas: So we got -- so what we did for Chris is we took a number of the questions and kind of summarized them and abstracted them a little bit just to talk about some key topics. So one of the ones I thought we would start with and I'm going a little out of order because I've had some decaf tea so I'm fired up now . We're going to start with dairy because, Chris, from my quick look looking at your stuff and some of Robb's comments in the past, I think there may be a little bit of some discrepancies on your opinions on dairy and how it should be used in a healthy diet.

Part of the things we like to do is certainly get some opposing opinions on here because it helps us learn, grow, and healthy discourse and debate is always a good thing in our minds. So you wanted to give us a quick like 20,000-foot view of your opinions on dairy, and then we can kind of drill it down from there?

Chris Kresser: Yeah. Sure. I think dairy is a highly individual issue. So I try to stay away from making any blanket statements because it really does boil down to individual tolerance. With that in mind, I think dairy and particularly raw dairy products, can be a really healthy food when they're well-tolerated in the absence of any leaky gut or cross-reactivity.

There's a lot of traditional cultures that thrived on dairy. Some of them, you know Weston Price studied, like the Swiss and the Maasai. In fact, some of those cultures lived almost entirely on grass-fed dairy. The Maasai ate -- their diet basically consists of meat, milk, and blood, and

they're exceptionally healthy. And then you have like the Lötschental Swiss who ate mostly pastured dairy products especially at the times of the year where they couldn't eat any plant foods.

So that said, I'll be the first to say that dairy protein is one of the first things that people cross-react to when they're gluten-intolerant, and that for anybody who has a leaky gut, dairy proteins are going to be potentially problematic because if they get through the gut lining and in the bloodstream, they're going to cause an immune reaction. So for me working with patients, I usually -- if anyone has got a leaky gut or chronic inflammatory condition, I usually have them remove it until we can restore their intestinal barrier integrity.

But once we do that, then I like to do -- start to gradually add dairy back in starting with the highest fat, lowest lactose dairy products like ghee and butter and then moving through the spectrum to the products that contain more lactose. I generally think that pasteurized, non-fermented dairy, just like straight pasteurized milk, is not really a good food for anybody because I look at it more as a processed food than a whole food. Raw milk has lactose, but it also has lactase which is the enzyme that's required, of course, to break down lactose. But pasteurization kills lactase, and so you only get the lactose and not the lactase and then none of the beneficial bacteria that are in raw milk either.

So you sort of take out most of the good stuff and leave the stuff that's potentially problematic. So I'm not a fan of pasteurized milk. I think yogurt and kefir and fermented dairy products made from pasteurized milk can be okay because they, of course, then have the bacteria and a lot of the lactose has been broken down during the fermentation process. So that's my -- maybe that's a little lower than 20,000 feet. But that's my spiel on dairy.

Robb Wolf:

And it's funny like several folks -- I think there's a couple of different topics on here where they were like, "Well, you and Robb disagree on this, that, and the other," but there's nothing that I would disagree with any of that. My position on dairy has always been it's a potential problem, kind of a gray area kind of item, pull it out, get healthy reverse dysbiosis. Make sure your vitamin D levels are good and then reintroduce and just kind of check your temperature and see how you do with it and then kind of roll from there.

Professor Cordain has had some misgivings about some potential problems with the IGF activations and potential problems with cancer down the road with dairy. Chris, can you -- I mean from -- this is kind of

drawing back into that epidemiological flesh, anthropological type stuff. We just don't really anything like that in these dairying cultures --

Chris Kresser: Exactly.

Robb Wolf: -- like the Maasai and whatnot. So it starts sounding a whole lot like when we talk about animal proteins causing cancer, and then we throw out examples like the Ache Indians of Peru or the Inuit with they're eating about 90% animal product diet, and they're experiencing no cancer.

Chris Kresser: Right.

Robb Wolf: Is there any thought to that? Do you think some of the processing might be an issue there or where might there be some --

Chris Kresser: Yeah. I mean it's certainly possible that -- it's not only possible, it's actual that pasteurized dairy has a different effect on the body as I was just explaining. And certainly -- and the Maasai weren't pasteurizing their milk.

Robb Wolf: Right.

Chris Kresser: And none of these traditional cultures were. So that's a possibility. I think I agree completely with what you were saying about the difficulty in isolated nutrient studies because -- I mean we know very well what the risks are with that. Like look at T. Colin Campbell and his studies that show that casein causes cancer. Well, that's interesting, but what he neglected to mention was that whey is anticarcinogenic. And casein doesn't really appear without whey in foods.

So if you just look at the isolated nutrients, you often miss the whole picture and that's just a good example. From my research, I haven't seen any actual human studies that show anything but benefit over a long period of time with full fat dairy consumption. Now, low-fat or non-fat dairy is problematic because we need fat to absorb protein, particularly vitamin A, fat-soluble vitamins like vitamin A. And if you're eating or drinking a lot of skim milk and eating a lot of super lean proteins without enough fat in the diet, then you'll pull the fat-soluble vitamins out of the liver and end up being deficient in those fat-soluble vitamins which is -- I think most people know now is a really bad idea.

Robb Wolf: Sure. Chris, did you -- now, I sent you this paper maybe two hours ago, so I don't know if you had a chance to look at it. But a friend of mine, Mike Malloy, shot me a paper looking at some gut permeability issues and

actually relating it back to actually retinoic acid vitamin A. Did you get a chance to look at that yet?

Chris Kresser: No, I was seeing patients this morning. I just got home --

Robb Wolf: Damn you!

Chris Kresser: Yeah, sorry about that.

Robb Wolf: Damn you and your work schedule. Maybe we'll call you back on the show later, and we can talk about that.

Chris Kresser: Then talk about it, yeah.

Robb Wolf: Andy, do you think that's a thorough enough accounting of dairy? You got anything else we can --

Andy Deas: Well, can I in California get raw milk?

Chris Kresser: You can. You can -- California is one of the few states that permits it. Whole Foods used to carry it but they sold out, so they're not carrying it anymore. There are -- sorry, I have a little bone to pick Whole Foods and their vegan agenda.

Andy Deas: I was just going to mention that.

Chris Kresser: We'll talk about another time. But they used to carry it. They're not anymore because of supposed liability concerns even though there's been a lot more cases of food-borne illness with pasteurized dairy than there has been with raw dairy, way, way more. You can -- I don't know up there what your health food store scene is like, but down here there are several stores that carry it. Organic Pastures is one brand and Claravale is the other.

Robb Wolf: And I think some states, it just needs to be labeled "Not fit for human consumption" --

Chris Kresser: Right.

Robb Wolf: -- and "Pet only." And so it's kind of open season on that kind of deal.

Chris Kresser: I'm getting it for my "pet," yeah the code word. And then in other states - - in all states actually, you can do something called a "cow share" where you basically buy a share, a part of a cow more or less, and that entitles

you to drink the milk because you're not -- they're not selling the milk to you. You're actually part owner of the cow. So they kind of skirt the legal issue there. So you can sometimes contact farmers in your local area and do it that way, and it's usually cheaper that way anyways.

Robb Wolf: Cool.

Andy Deas: I bought some raw butter -- milk when I was in Indiana, and I noticed that nice label "Not safe for human consumption."

Chris Kresser: They like to scare the heck out of you. Of course, they can put that on the loaf of bread that's sitting right next to it.

Robb Wolf: Yeah, yeah, or the Mountain Dew with the high fructose certainly.

Andy Deas: This was at a nice, very nice kind of Farmer's market that also served wine so you could drink and shop for your farm goods.

Robb Wolf: Nice.

Andy Deas: It was really nice, very nice outside kind of a rustic location. I was thinking on your Whole Foods and their vegan propaganda. I don't know that -- if you've heard about this, but my brother's girlfriend works for some of the Wynn properties in Vegas, you know Steve Wynn, and he has provide free of charge for all the employees these wonderful DVDs with some great vegan propaganda.

Chris Kresser: Oh, boy, brainwashing.

Andy Deas: They just show up to work and learn about how to eat healthy and safely and live longer.

Chris Kresser: Vegan -- is that like the vegan buffet in Vegas? I haven't seen that one yet.

Andy Deas: Well, in all the Wynn properties they've gone back and now added vegan entrees for Steve and his employees to eat healthily.

Robb Wolf: It must have clove cigarettes.

Chris Kresser: Yeah, and seitan the really healthy gluten-processed fake meat. Yeah.

Andy Deas: The rise of the vegan powers. Watch out.

Chris Kresser: Hey, Robb, I hope we're not disappointing people. I think they wanted us to get a little bit Jerry Springer on the dairy and fish oil issue. I guess we still -- there's still a chance with fish oil. We'll see.

Robb Wolf: Yeah. We'll see if can drum up some controversy, but it's just funny. People -- this is almost exactly like the fish oil calculator that Dallas & Melissa have on their website which says, "If you're overweight, sick, inflamed, use a lot for a period of time then dial back," but nobody seems to read that. But maybe we can drum up some controversy.

Chris Kresser: Yeah.

Robb Wolf: Should we talk about fish oil next?

Chris Kresser: That's a good segue. 20,000 view?

Andy Deas: You could just go whatever view you want to go with. I'm not even going to estimate it anymore. And I think people like details, that's why Robb has a podcast. He's not Dr. Oz. We're going to go with the details.

Chris Kresser: Okay. Details it is. The first thing I'll say is that my view on fish oil has evolved over time, and as I learned more, I hope to continue to evolve my opinions. If I don't, I'll be in big trouble.

Robb Wolf: That's crazy talk.

Chris Kresser: Yeah, yeah, sorry. From what I've learned -- and I've done a lot of research on this topic. It's one of the things I have looked into probably more than any other issue on my blog, other than heart disease, but they are obviously related. I think the benefits of fish oil supplementation have been pretty overstated. Most of the studies that show benefits are short-term. They generally last less than one year. Even those don't necessarily show the benefit that most people think.

The Cochran Group did an analysis -- a meta-analysis on almost 80 trials lasting more than six months. And the only statistically significant effect they were able to find was a reduced risk of heart failure. But there was no reduction in cardiovascular and total mortality. And one of the things that worries me the most is that the only fish oil study lasting more than four years which is the DART 2 trial, showed an increase in heart disease and sudden death.

So of course, the question is why and how could this happen? Well, if you know -- understand that structure of fats, fish oil is a polyunsaturated fat,

omega-3 polyunsaturated fat, which is the most unstable, and the most vulnerable at oxidative damage of any fat; even more unstable than the dreaded omega-6 polyunsaturated fat. And what we know is that when fat particles oxidize, they break down into smaller compounds like MDA. And MDA is dangerous because it can damage proteins and DNA and other cellular structures.

And in fact, studies do show that oxidative damage by compounds like MDA increases as the intake of omega-3 fat increases. So for example, I think one study found that six grams of fish oil per day, which is not a huge dose but it's more than a maintenance dose, increases lipid peroxides and MDA regardless of whether those people supplemented with vitamin E or not.

So to be fair, some shorter-term trials have shown a benefit, like the GISSI and DART 1 trial found that fish oil can prevent arrhythmia in patients with chronic heart failure and a recent heart attack. But there's really not much evidence that people other than that -- other than those with chronic heart failure and arrhythmia benefit, and there's no evidence that higher doses above one gram provide a benefit over smaller doses over the long term.

And it's logically assumed that the effects of oxidative damage would take a while to manifest, and actually, that they would increase as time goes on, which is probably why we see a benefit in the short term studies as the omega-3 displaces the omega-6 in the tissue. But then the benefit declines and even turns to harm in the longer term studies as the oxidative damage increases.

So I basically -- my thing with balancing the omega-6-3 ratio is to just dramatically decrease omega-6 as much as you possibly can, and then eat fish three times a week, fatty fish 6 ounces three times a week. And maybe take some fermented cod liver oil which we can generate some controversy with that one too probably, Robb. And then if you do that and your intake of nuts and dark meat poultry is moderate, and you're not eating any seed oil, it's pretty -- you can do it. You can have a 2:1 or 1:1 omega-6-3 ratio. So I'm in favor of doing that, rather than big, big doses of fish oil because of the danger of oxidative damage.

Robb Wolf:

Now, what about somebody coming on the scene, like they roll in as a client and lots of systemic inflammation, pretty overweight, maybe some depression, just kind of classic metabolic syndrome, classic systemic inflammation? This is where my thought -- and this is based in part off of a couple of papers. One of them is this glucose history paper which is

talking about gene expression and the totality of gene expression kind of having a drift, If you imagine, like a big super tanker, like a ship like the Titanic. The genetic expression starts getting kind of almost momentum or kind of an inertia to it, and in order to flip things around, sometimes you need a pretty dramatic input. And so that was some of the thought, and the authors of that paper were actually talking about omega-3's as a means of righting the course on that ship that's gone awry.

And so for a long time I was kind of thinking that generally higher intake of omega-3's would be beneficial, and then start reevaluating that. And so I guess where I'm at right now is that if the individual is sick, inflamed, has some problems, do you get that rather large dose of fish oil to right the ship, but then the rest of the dietary and lifestyle factors should fall into place such that it's essentially what you're describing, like a low linoleic acid intake, the short-chain omega-6 intake.

Everything else should follow into place, and I think for a long time the thought was that large amounts of omega-3's could simply counterbalance omega-6 or could undo systemic inflammation, which I think we're pretty sure that that's inaccurate at this point. But what do you think about that short-term punctuated use or would you prefer just dial down the omega-6's and tackle it that way?

Chris Kresser: That's my preference, but I can see the logic behind that. And I just want to remind people that we're talking about the last 10% here probably. What I mean by that is, I don't think that taking high doses of fish oil for a short period of time like a month or six weeks is going to have a serious lasting negative consequence.

Robb Wolf: But you're also not sold that it has significant benefit?

Chris Kresser: I'm not sold. I'm not sold that it doesn't. I try to keep an open mind on that, but I can just tell you that my preference, in terms of working with patients, is what I said, just to really dramatically -- because I think dramatically lowering the omega-6 is going to have -- it alters the tissue -- it's going to alter the tissue ratio in a similar way. The problem though is not as you probably -- I'm sure you've encountered, is not everybody is either willing to do that so quickly right off the bat.

So if somebody is -- I just try to kind of work with people where they're at. I'm a little bit of a hard ass. I mean if people aren't willing to do -- to make the changes that I'm suggesting, they usually don't stick around for that long because it's just -- that's what I have to offer. But at the same time, I'm also -- I understand that they are huge changes. And they're

really -- have a huge effect on our life. I mean it's sometimes difficult for us who have been living this lifestyle for a while, to remember how significant those changes are.

But yeah, I'd say, in general, I'm in favor of just cranking the omega-6 as low as possible, and then eating fish. And I'd feel more comfortable about people bringing in more omega-3's just by eating fish more regularly, than I would from them taking huge doses of fish oil.

Robb Wolf: That's cool.

Andy Deas: So Chris, just because we have a fairly broad audience of folks, I'd be curious if you would share -- you know you mentioned one thing about nut intake, the ways that you see are the most important to help limit your omega-6 intake.

Chris Kresser: Yeah. I mean obviously all the seed oils are just right out, and I don't think anybody who is following a Paleo diet is eating those, so we won't spend too much time on that. But all the omega-6 seed oils like cottonseed, corn, soybean, et cetera, those things, they're in packaged foods a lot too. So even the sort of "organic healthy" packaged foods, you've got to look out for them.

But one of the surprising things for people to learn is how much omega-6 nuts have, most nuts at least, and poultry. Dark meat poultry with the skin on it, has about 16 to 18 times more omega-6 than even grain-fed beef, which is pretty significant. It's pretty dramatic. I forget the actual number from the grams, but it's high. It's higher than you would think. And then even a -- if you eat just like 100 grams of walnuts a day, which is kind of a lot, but it's not beyond what I've seen people -- some of my patients come in with, that would -- you would be consuming about 265 grams of linoleic acid a week from just 100 grams of walnuts a day.

To give you an idea of how much fish you'd need to eat to have an even ratio of omega-6 to omega-3; that would be 34 pounds of salmon. So it's real. It's like the nuts, they've got a lot of omega-6, and they're certainly healthy. There are a lot of healthy things about nuts, but I think -- I don't think from an evolutionary perspective, we were chowing down several handfuls of nuts a day. And I think that the omega-6 burden of that can be pretty significant.

Robb Wolf: Almost impossible to get out from under.

Chris Kresser: Impossible. Nobody's going to eat 34 pounds -- it's impossible unless you're taking 15 or 20 grams of fish oil a day, which again my -- I would just rather see people eat less nuts.

Robb Wolf: Right.

Chris Kresser: And poultry was kind of the biggest surprise I think for most people, especially like with the skin. Because usually we're teaching people not to be afraid of fat, but then when I'm warning people, okay, don't be afraid of fat, of saturated fat, especially, but you might want to put the brakes on with the dark meat poultry and the skin and just have it a couple of times a week instead of making that your main animal protein source.

Robb Wolf: So this may be outside the scope, but do you know if that's a result of some different feed that goes to the critters or do the birds preferentially store omega-6's in the dark meat area mainly arachidonic acid or is it linoleic acid or...?

Chris Kresser: I think it's a little of both. And to answer your question, I mean certainly chickens that are grass -- pasture-raised and they're eating worms and grubs and K-1 in the grass and things like that, they're going to have a better or more favorable fatty acid profile. I've been looking for studies that compare the fatty acid profile in the meat of pasture-raised chickens versus the meat of grain-fed chickens. I haven't been able to find any. So if anybody out there knows some, send them our way. That would be great.

I have seen several studies comparing the omega-6 content of battery chickens versus pasture-raised chickens, and there's significantly more omega-6 in their eggs; so I think it stands to reason that there would be significantly more omega-6 in their flesh as well.

Robb Wolf: Sure.

Chris Kresser: So it does matter pastured versus battery -- battery raised. But still I think even a pasture-raised chicken, they're still eating grain. For example, we have chickens in our backyard, and they need some kind of grain to flourish and to lay well. And so we were looking -- we set out to find some soy-free, corn-free feed figuring that that would significantly lower the omega-6 ratio in the eggs, and it was almost impossible to find. We ended up -- I mean we literally ordered feed from a farmer in Washington. That's the closest place that we could find that makes a soy-free, corn-free feeds.

So I think even pasture-raised chickens are eating a lot of corn and soy, and that's bound to raise the omega-6. So again, I don't want to tell people -- I'm not saying, "Don't eat chicken." I'm just saying don't make it the staple meat.

Andy Deas: So to follow up on that, "Don't make it the staple meat," since Matt Lalonde started the little, now ritual, of getting an example days of food, Chris, what did you eat today?

Chris Kresser: Okay. Let's see. So I had two eggs from our backyard girls, a couple of pieces of bacon, which Diane will be happy to hear, half a sweet potato with about 2 or 3 tablespoons of grass-fed butter, and some raw kimchi, which is like fermented vegetables for those of you who don't know what that is. For lunch, I had some grass-fed ground beef I made with Indian spices like Keema, it's kind of the name of the recipe, with some -- I've been on a kick lately for -- anyone who has seen my Facebook page, I take pictures of my meals sometimes. I've been making these taro chips, so I get taro and slice it pretty thin, and then I roast them in lard or duck fat and with some salt and pepper. They're so good. So I had some taro chips and then a green salad with olive oil and vinegar. That's it so far.

Robb Wolf: Nice.

Andy Deas: I like it. Cool.

Chris Kresser: Yeah.

Andy Deas: You mentioned --

Chris Kresser: I'm glad I hadn't stopped at McDonald's on the way home.

Andy Deas: Well, I don't know if you listened to the episode where Matt Lalonde went into talking about how much he eats which takes a full hour to consume. It's like a pound or a pound and a half of grass-fed beef with enough vegetables to kill a small animal.

Robb Wolf: That's his post workout meal so he's -- yeah.

Chris Kresser: I eat a little more on the workout days. But today is pretty sedentary.

Andy Deas: Since you mentioned kind of the sweet potato thing, I know there is this question about kind of safe starches and also about intermittent fasting. So you want to give the -- give your thoughts on safe starches and then also head to the magical intermittent fasting?

Chris Kresser: Yeah. Safe starches, I love them. That's the -- I mean I think they're great. I think they're a great source of glucose and a healthy carbohydrate that the body can easily absorb and make use of. I personally eat a pretty fair amount. I'm not a low-carber myself. I'd probably eat about 100 grams. I guess some people would consider that low-carb. I consider it to be moderate, 100 maybe 125. I find that I just start losing weight if I eat less than that no matter how much fat and protein I eat.

So I eat a lot of yams, taro, lotus. Lotus is a good one. Not many people are aware of that. It's a good safe starch. Green plantains are good, kind of a savory taste, not very sweet and then yucca. Yucca is another favorite. I like to make mashed yucca. It's a good substitute for mashed potatoes. You can also make yucca fries.

Andy Deas: Yes. That's excellent.

Chris Kresser: Yeah. So I think safe starch is great. I generally suggest around 100 grams a day as an average carb intake. I see a lot of patients come in, I just talked to one this morning who was on an extremely low-carb diet or even zero carb diets, and they're not losing weight. In fact, sometimes they're even gaining weight. And they're on intermittent fasting and they can't really figure out what's going on. And when I have them start to add a little bit more carbohydrates in which makes -- it's like totally counterintuitive in terms of what we all -- what you might think in terms of weight loss. They actually start losing weight again.

And then in terms of intermittent fasting, it's a similar thing. I think intermittent fasting from an evolutionary perspective is right on. I mean it's very -- almost certain that that was the norm for human -- most of human history, and that we're programmed to do well without eating for certain periods of time, and you can stimulate autophagy and cellular cleanup process and stuff like that.

But I also know that most of us are pretty far outside of evolutionary norm at this point, with the traffic and late night Facebook and environmental toxins and just crazy amounts of stress that people are under, takes its toll on the adrenals. And fasting can be a stress on the adrenals. If blood sugar gets low, cortisol will -- adrenals will secrete cortisol and bring it back up. And that process over a long period of time can deplete cortisol levels or can dysregulate the cortisol and melatonin rhythm.

And so if someone has basically healthy metabolism then intermittent fasting seems to work really well. Some of my patients come in, and their metabolism is all screwed up, and their intermittent fasting; they're getting worse. And I know some people believe that if you just continue with intermittent fasting that eventually it will -- things will improve and even not and maybe that's true.

Robb Wolf: I think sometimes you call that death.

Chris Kresser: Right. I'm open to the possibility that in some cases that would happen. But I just see people getting worse. And so I actually will have them go almost to the other extreme and eat every two to three hours. I know that's kind of sacrilege like in the Martin -- you know in the Lean Gains world, but it works. These people start to lose weight, their blood sugar normalizes, and I know that because I'm having them test with the glucometer. So we've got evidence of it. Their symptoms of blood sugar dysregulation disappear, and they feel better. So it's just something to be aware of. I like intermittent fasting. I do it myself about two to three days a week, but I don't recommend it for someone who's got metabolic problems.

Robb Wolf: So you're saying this is not a one size fits all scenario.

Chris Kresser: Yup, that's what I'm saying.

Robb Wolf: Damn you!

Andy Deas: Damn!

Chris Kresser: Yeah. It rarely is which -- we always want it to be that way, but it almost never is at least in my world.

Andy Deas: It never is in any world, Chris.

Chris Kresser: Actually it is in some people's world, Andy. That's the problem.

Andy Deas: But that's not reality.

Chris Kresser: Right.

Andy Deas: You know what's funny, there is this question on here about constipation on a Paleo diet, and you'd mentioned it's a common problem. When I was having this discussion with one of the local docs down in Transitor Gym, I was at his lecture and people were asking him about constipation

on Paleo diet. He was like, "I don't even know how that's possible." And I was like, well, I kind of went into a little bit. So maybe you can talk a little bit about why you think this is a common problem, and things that you generally recommend to help resolve that.

Chris Kresser:

Yeah. I think constipation -- I mean there are several different causes, of course. But one of the main causes that's not often talked about is that 70% to 80% of the dry weight of stool is bacteria, which is lovely to think about. But that's what it is. It's mostly bacteria. So if you don't have enough good bacteria in your gut, you're not going to have regular stools. So this is the whole thing about fiber. A lot of people think that the benefit of fiber is that it's kind of like a mechanical effect where it pushes the stool through and stimulates motility, et cetera. And it does have some mechanical effect.

But the real benefit of fiber comes with soluble fiber because it feeds the beneficial bacteria in the distal colon. We can't digest it, so it goes all the way through to our colon, and that becomes food for the bacteria there. And they produced short-chain fatty acids like butyrate and propionate and acetate, and those short-chain fatty acids become -- are the fuel for colonocytes, the cells in the colon.

So I think what probably happens for a lot of people who were on a diet with a lot of insoluble fiber that has that kind of mechanical effect and they switched to a Paleo diet which tends to be -- it doesn't have any grain fiber in it at all and tends to be generally lower in fiber especially if they're switching to a low-carb Paleo diet where they're not eating the sweet potatoes, and, say, starches which have the soluble fiber; they go from having that mechanical effect, and then the benefit of the soluble fiber to not having much of that at all. And so that's probably where the constipation comes from, I think.

So what I -- the solution to that is making sure that they've got enough good gut flora, and that generally means eating more safe starches and things like sweet potatoes, leeks, all of the starches that I mentioned before. And if that doesn't work or if they can't tolerate a lot of starches because of blood sugar issues, then I will use probiotics and prebiotics which is basically the same concept as the fiber. The prebiotics are indigestible carbohydrates that feed the bacteria especially bifidobacteria.

So we'll do that. Try to have them increase their fermented food intake like Sauerkraut or kimchi or any -- basically, any fermented vegetables or fermented dairy if they tolerate it well. The other thing is magnesium and

potassium. Potassium is needed for motility and magnesium can help bring some water into the colon and help with motility as well. It's also a smooth muscle relaxant, so it can give a little boost that way.

So some combination of magnesium, potassium, if their deficient in potassium, and then sweet potatoes, safe starches and prebiotics and probiotics almost always does the trick; and if it doesn't, it's usually a sign that there's something else there that needs to be investigated.

Robb Wolf: Chris, do you ever see a situation in which actually the removal of some gut irritants like gluten or some other grain items may actually be part of the constipation at least initially?

Chris Kresser: You mean like if the gut irritants were promoting hypermotility?

Robb Wolf: Yeah, yeah.

Chris Kresser: Yeah, I think so. It's sort of -- in a sense they probably would have been constipated anyways, right? But they were eating these irritants that increased their motility, not necessarily in a beneficial and healthy physiological way, but it had kind of -- it kept them going at least.

Robb Wolf: Right.

Chris Kresser: Yeah, I think that's legit.

Robb Wolf: Andy, anymore questions on poop?

Andy Deas: No. I feel like I'm talking to Garrett Smith right now.

Robb Wolf: One of Garrett's favorite subjects.

Chris Kresser: I think another thing, I mean this might go without saying, but if there's a leaky gut, that's got to be fixed because a leaky gut is going to cause inflammation, and inflammation will impair motility and also dysregulate the gut flora. So I would say if somebody is doing everything that we just talked about, and they're still constipated, it's probably a good idea to do some testing and kind of get under the hood a little bit and see what's going on.

Andy Deas: I know we've talked before that there was some kind of exciting research related to leaky gut and especially gluten intolerance, and so we may want to spend a few minutes touching on that because --

Chris Kresser: Yeah.

Andy Deas: -- I think -- I'm really excited about this. I'm sure everyone is.

Chris Kresser: Oh, yeah, this is like a hot topic on the street.

Robb Wolf: Well, about a 98.6 topic or 37 Celsius but yeah.

Chris Kresser: Yeah. I get home from these seminars and my wife is just looking at me and shaking her head like, "How can you get so excited about gluten intolerance or leaky gut?" but I do. Let's see here. Yeah.

Robb Wolf: Chris, you don't need to hide anymore. You're with us, man. You're with safe people now.

Chris Kresser: I'm safe, man. I'm all right. I think leaky gut is -- if we're going to have a pathology of the 21st century, it's leaky gut. I think antibiotics were kind of a medicine of the 20th century for better or for worse, and probiotics or at least figuring out how to fix the gut is going to be the focus of this next period of time because what we're seeing now is that leaky gut is way more common than we thought. It's no longer this kind of freaky weird alternative diagnosis that only quack practitioners make. It's totally mainstream.

If you look on pub mag there's like -- and search for intestinal permeability which is the medical term for it, you'll see about 9,000 papers come out, 9,000 results. You have big time researchers like Alessio Fasano, who have pretty much built their last 10 or 15 years of their career on it.

And so here are a few things that we know. There are basically three things that can destroy the gut lining. You can have a total destruction of the cell which is called -- that's transcellular intestinal permeability. Then you can have a loosening of the junctures of the gut lining or the tight junctions that's paracellular. And then you can bacterial infection. Those are three things that will destroy the gut lining.

So the bacterial infection, what happens is lipopolysaccharide or LPS which is an endotoxin that's found in the outer membrane of gram negative bacteria can provoke a really strong immune response. With the tight junctions you've got proteins like occludin and claudin that kind of form -- that are main players in forming the tight junctions. Then you've got a protein called zein which I know you guys have talked about before which is -- you can kind of think about it as a traffic conductor or gatekeeper or

maybe like a doorman at a bar or something like that. Zein basically is responsible for deciding what gets in the bloodstream and what stays out. It's a pretty important role.

And so what happens is that when things go wrong, with zonulin -- and what might go wrong is that if you eat gluten, for example, we know that gliadin, one of the proteins in wheat, up regulates zonulin production, and that causes basically the cells -- the spaces between the cells to open up, and then the gut becomes permeable which allows harmful bacteria and toxins to pass through above and beyond the nutrients that we want to. But one of the interesting things about leaky gut is that the research now shows that the majority of people with leaky gut don't even have gut symptoms.

So this is really interesting. They'll have like skin issues, like psoriasis and eczema. They'll have depression or cognitive impairment or Alzheimer's or Parkinson's or other kind of neural degenerative conditions. They might have joint problems, and of course, this is all the stuff that you guys are talking about every day, but we're just starting to understand the mechanisms for it in a much deeper way.

I guess the last thing to say about it is that we know that zonulin, which is as I just explained, is involved in making sure that the gut barrier is solid, is also involved in regulating the blood brain barrier. So when you have up regulated zonulin from eating gliadin or there are other things that can do it too; not only we have a leaky gut, you're going to have a leaky brain. So this is why you see a lot of brain and psychological and emotional symptoms that go right along with gut symptoms or even are present without gut symptoms and people with gluten intolerance.

It's nothing new necessarily, from a perspective of how you actually live and eat, but for those of us who are into the science, it's really interesting that we can now explain how all this stuff works, and we can walk into our room with doctors and researchers and say it, and be able to back it up completely with peer reviewed research. So it's going to make this stuff mainstream, and actually the main thing that's going to make this mainstream is there is a drug company now developing a leaky gut drug. I don't know if I -- did tell you that, Robb.

Robb Wolf: I was reading an article on it just this morning actually, yeah.

Chris Kresser: Isn't that scary?

Robb Wolf: Yeah.

Chris Kresser: So basically, what the drug does is it down regulates zonulin, and it's been shown in animal studies to reduce intestinal inflammation and actually reduce leaky gut in animals. But, of course, we don't know what other proteins it might be down regulating, and what other affects that is going to have as far as that goes. The other way that drug companies are screwing with zonulin is they're actually using zonulin as drug delivery method. With the idea that if they give you a leaky gut with zonulin, you're going to absorb the drug better.

Robb Wolf: Which is the deal with adjuvants in orally administered vaccines.

Chris Kresser: Exactly.

Robb Wolf: But yeah, there's a hell of a problem with that.

Chris Kresser: Yeah. I don't even know where to start, but they're doing it with insulin. But once a drug company gets its teeth into something -- now, of course, you're going to start hearing all about leaky gut, and that's going to be pharmaceutical sales brochures and all the -- as I said on my other podcast, all the farm sales reps are going to be getting in there Ford Taurus's driving around and telling all the doctors about leaky gut. There's a drug for it now, so it's going to be front and center.

Robb Wolf: Which is scary on the one hand, but it also legitimizes the lunatic fringe element of this too.

Chris Kresser: That's right.

Robb Wolf: So there might be some opportunity there.

Chris Kresser: Yeah. I think this will be positive overall.

Robb Wolf: Yeah.

Andy Deas: So we're getting close to the end of the hour.

Chris Kresser: All right.

Andy Deas: So let's go back to work, but I know we talked about something earlier that may have some disagreements, cod liver oil.

Chris Kresser: Cod liver oil.

Andy Deas: Chris, I know you mentioned that you are sort of a fan of fermented cod liver oil.

Robb Wolf: You know what? I asked Matt Lalonde this one, and I haven't really been able to track it down. What is the benefit of fermented cod liver oil, and what exactly is getting fermented?

Andy Deas: Yeah.

Chris Kresser: Fermentation is just the way they process. So normally, the way that cod liver oil and most fish oils really are processed is that they will use heat to basically remove the smell. They take out the vitamins -- I'm getting a little feedback here. Can you guys hear me?

Robb Wolf: You're good on our side, yeah. This is our performance art.

Chris Kresser: Okay. Sorry. I'm hearing my voice three times in my ear, so I'm a little distracted here. I'm going to take off my headset. Yeah, so in the processing of it, they use heat and they usually will end up pulling out the naturally occurring vitamins, and then when they put them back in, almost all companies put synthetic vitamins back in. Most people don't enjoy the smell or taste of cod liver oil, so they do what they can to make it more palatable. And that process usually involves heat and, of course, heat is no good with highly fragile polyunsaturated fats that are present in cod liver oil.

So there's one company, Green Pasture, that uses the traditional method of processing cod liver oil which is fermentation, and this is something that makes it last longer and also changes the assimilability and structure of it. But the best benefit of fermentation versus the heat is that it allows -- first of all, the peroxides are a lot lower because they're not applying heat to the fragile oil, and second of all, they leave the naturally occurring vitamins in it. So you're getting a naturally occurring vitamin A and vitamin D and vitamin E and quinines instead of something synthetic added back in.

So that's the deal with fermented. In terms of cod liver oil, the main objection, of course, is that vitamin A is toxic in high doses. It's definitely true that vitamin A has a potential to be toxic in high doses, but what the research suggests is that that's only true against the backdrop of vitamin D deficiency. And they've done studies where people who are supplementing with vitamin D, like the hypothetical 160-pound person, they're supplementing with vitamin D that will raise the toxicity threshold of A over 200,000 IU a day, which is almost impossible to get that much. I

think 3 ounces of beef liver has about 25,000 IU per day, and I don't know anybody who's eating --

Robb Wolf: Thirty ounces?

Chris Kresser: -- 30 ounces of beef liver. But I think a lot of people are deficient in vitamin D. I mean 50% of Americans from when I last checked. So for the average person to give them a lot of vitamin A without making sure that they are getting enough vitamin D, that's probably a bad idea. That's, again, another reason that I like cod liver oil as a fat-soluble vitamin supplement, is that it has both D and A in it in a naturally occurring ratio. So it's way less likely that you're going to develop any toxicity from A if you're taking cod liver oil, than if you were taking some kind of synthetic A supplement or just eating organ meats which tend to be not very high in vitamin D.

Robb Wolf: Do you like Carlson cod liver oil? That's been kind of a favorite of mine of late. Have you followed their stuff at all?

Chris Kresser: Yeah. The only company that I know of that does the fermentation and doesn't heat process is Green Pasture. I have no affiliation with them whatsoever. I just use their product and recommend it because it's, from my estimation, the best one available. It's kind of inconvenient because you have to order it online, but from my research, it's by far the best one out there. So that's generally what I recommend.

Robb Wolf: Cool.

Chris Kresser: Yeah.

Andy Deas: All right. Chris, anything else you want to say before we wrap this up? And we will definitely have to have you back, and we'll have a gauntlet maybe you versus MaTt Lalonde versus Robb.

Robb Wolf: It would be like Godzilla versus --

Chris Kresser: Maybe we can get a set and start throwing chairs at each other or something like that.

Robb Wolf: Perfect.

Andy Deas: Poor Kurt Harris will get wrapped into this too. We'll just pull everyone we can find.

Chris Kresser: I'm a lover not a fighter, Andy.

Andy Deas: Anything else that you want us to know before you go?

Chris Kresser: No. I've had a great time. It was a good time talking to you guys.

Robb Wolf: So first remind everybody about your website.

Chris Kresser: It's [thehealthyskeptic.org](http://thehealthyskeptic.org) and lots of articles there, podcasts, and other fun stuff. So come check it out if you haven't already. Robb, Andy, thanks a lot for the opportunity. It was great fun.

Robb Wolf: Awesome.

Andy Deas: Thank you so much.

Chris Kresser: All right. Thank you, guys.

Andy Deas: With that, that is the end of episode 69, and you guys have a great day. I'll talk to you next week.

Robb Wolf: Later guys.

Andy Deas: See you.