



# THE FAT SUMMIT

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*Separating Fat From Fiction*

Transcript:

Interview with Chris Kresser, M.S., L.Ac  
[chriskresser.com](http://chriskresser.com)

Interview by Mark Hyman, MD  
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**Dr. Hyman:** Hey everybody its Dr. Mark Hyman. Welcome to the Fat Summit, and I'm here with my good friend and a wonderful man, and as well as extra ordinary, investigative doctor and thinker in the field of nutrition, who actually I've learned a lot from, Chris Kresser and you maybe know Chris because you probably get his blog, I do, it's one of the few actually that I do subscribe to because I want to know what he's thinking, and what he's saying because it's always something good.

And if you haven't read the read the stuff that his written, it's thoughtful, it's deep, it's investigative, it brings up issues that nobody else is talking about, and for me it's just really enlightening because they is very few voices that are really inquiring in a very objective way about what the science says, about food and nutrition and health and I'm just really excited to have you as part of the summit Chris, because we know each other in we've had many conversations about this.

And we're both seeking to find the truth, and this summit is really getting the truth of what's going on and you wrote a fantastic book called the Paleo Code and the Personal Paleo Code, which is really an important word like personal, because as we've had many conversations there isn't one size fits all, it's not like the high fat diet works for everybody, or high carb diet works for everybody, or high...it's like there's a personalized approach to this that we have to think about it.

And I really would love to get into that with you, and we're going to cover a lot of ground in this conversation, so let's start with how you got started in understanding, that maybe the Paleo concept was useful, and why it had value and tell us what you mean by Paleo because like does that mean eating steak all day, or like go putting on a loin cloth and going and hunting a buffalo, or like what is it? I know people are like...

**Chris:** See my spear in the background.

**Dr. Hyman:** Yeah, I saw that and people are like, "I'm just like eating this liver, and brains, and marrow bones." What is like, what is all that?

**Chris:** All right, well first of all Mark thanks for having me on, it's always pleasure to connect with you and I'm humbled by your introduction, and it's just great to be here and have a chance to chat about these topics, so let's see your first question about how I got on to the Paleo approach in general.

I got really sick in my early 20s and I was doing some surfing in Indonesia, I was doing around the world trip and I was living on a small island in Indonesia in a little village surfing and got the classic tropical illness, diarrhea, vomiting delirium fever don't really remember much of the three days there that happened, and ended up being giardia, entamoeba histolytica and amoebic dysentery or blastocystis hominis, all together at the same time.

**Dr. Hyman:** A whole family of parasites. You had like a whole community.

**Chris:** A whole family of Parasites moved in and it nearly killed me actually then was a long road even getting that diagnosis, took many years to get the diagnosis and then as you know some of the treatments for those parasites can be even worse than the parasites themselves, so took me about 10 years to rebuild my health.

Then along the way just through a lot of experimentation on my own, I discovered I didn't even know it had a name at that time but it was you know meat and vegetables, some starchy plants like sweet potatoes, nuts and seeds. I called it just kind of a real food diet without any grains or legumes, because I found that they irritated my gut, and then as I began to meet more people in the community and tell them what I was doing, they were like, "You know there's a name for this? There's a whole community of people doing this."

And I was introduced to Robb Wolf, who's kind of one of the modern fathers of modern Paleo movement, and we hit it off but pretty soon what I realized in my own journey is that no kind of canned approach that I had learned about, whether it was vegan or raw foods, or macrobiotic — all of which I tried by the way and some for many years — None of those canned approaches worked for me, and I basically had to use myself as a kind of personal laboratory to figure out what did work, and that's why from the very beginning I've just been really a big advocate of personalization, both on my blog and also with the patients that I work with, because you said it at the top there really is no one size fits all approach, and we have to...the more we learn about genetics, epigenetics and our relationship with our environment and the world around us. The more true that becomes in my opinion.

**Dr. Hyman:** Yeah, it's so true, I remember we met at this is event, and I was sort of joking because I was like on stage and on one side of me was like sort of serious, like Paleo guy. I was like a friend both of them we're really close friends of mine and the other one was like a vegan, and they're all doctors and we're like sitting up there and I'm like, this, back and forth.

**Chris:** You are an excellent peace maker moderator.

**Dr. Hyman:** And I'm like, "If you're Paleo and you're a vegan, I must be a pe-gan." And I made a joke.

**Chris:** No that's a great word and I'm glad you... I mean because the biggest misconception about Paleo approach is like you threw out a few of those you know, that it's all meat all the time. We're living, were sleeping out on the back yard in our loin cloths, and hunting all of our meals, I mean...

**Dr. Hyman:** I think it's like I call best is a plant based Paleo diet, it's like you eat most...

**Chris:** If you look at it, I mean you and I could go out to dinner. I'm sure our plates would look almost identical.

**Dr. Hyman:** Absolutely.

**Chris:** We have very...and we did share meals together and our plates did look very similar, so a lot of people might be surprised to know that, like here's this Paleo advocate and you but the reality is most the plate is vegetables, plant foods and then there might be a little bit of meat, or fish, or poultry. Not even necessarily with every meal.

**Dr. Hyman:** So let's dig in here okay, because like I agree with you and I found for me it works best, but there's a whole group of colleagues who we know and respect and who are smart doctors, scientists who are like, "No, we should only be eating grains and beans and meat is bad for you, and fat is bad for you, maybe not all fat now. Maybe you can take you can eat vegetables fat, like olive oil or avocados although that's new."

And then like although some people are still not saying that, but we should really be shunning animal foods, and for many reasons I mean that we can talk about the ecological reasons, and the environmental reasons in a minute, but I

think we're let's talk about the health benefits because I'm a doctor first, and I'm curious about like how do you answer that because it's a hard question?

**Chris:** Yeah, well I mean I try to answer with the research and just look at what the research says, and of course that's not always easy because there's often a lot of conflicting research, but I think it is possible to differentiate between good and bad research, and I mean what we seen just even last year is that the dietary guidelines no longer restrict cholesterol.

The most recent published dietary guidelines no longer say that we should pay any attention at all to cholesterol in foods, and that's a remarkable reversal given that for the last 50 years we've been told that we shouldn't eat egg yolks, or any other animal foods that have cholesterol, because if we eat dietary cholesterol we'll raise our serum cholesterol, and everyone knows that high serum cholesterol is a risk factor for heart disease.

But it turns out that this dogma which everybody accepted is not actually true, that for the vast majority of people dietary cholesterol has no relationship whatsoever to serum cholesterol, and that for the few people who do experience an increasing cholesterol when they eat it in their diet, in their blood, they get a corresponding a simultaneous increase of both HDL which is the good cholesterol and LDL which is the so-called bad cholesterol That cancels, the increase cancels each other out and it has no clinical significance in terms of heart disease risk, so I think that's a good lesson for all of us just to recognize that science is always evolving, that what we were absolutely sure was true 50 years ago, like we laugh at now, so it's almost certain that, that's going to be true 50 years from now looking back.

And from what I've seen in all of the most recent meta-analysis and reviews, the research that for so many years seem to suggest saturated fat and dietary cholesterol were the enemy is weak. It's weak enough that the dietary guidelines of already been changed for cholesterol and...

**Dr. Hyman:** But they still came out and were like, "No, no. cholesterol forgets about it, but fat don't worry about it, but saturated fats."

**Chris:** Talking about fat.

**Dr. Hyman:** Yeah, like saturated fats.

**Chris:** Yeah that so same saturated fat you should avoid, but you know Mark and many people watching and listening this know that there have been several books published recently with lot of research, summarizing a lot of research showing that the relationship between saturated fat and heart disease is very tenuous. Many large reviews...

**Dr. Hyman:** You mean The Big Fat Surprise, Nina Teicholz you mean.

**Chris:** Yeah.

**Dr. Hyman:** Yeah, I just interviewed her. She's going to be on the summit too.

**Chris:** Okay, cool. So studies published in major, major journals, high impact factor journals showing that low carb diets which are higher in saturated fat not only don't have an adverse effect on heart disease risk factors, but actually improve heart disease risk factors. They increase HDL cholesterol, they decrease triglycerides, and they decrease abdominal circumference and visceral obesity.

They decrease blood pressure, they decrease c reactive proteins so there are all of these effects that are positive from these higher fat, lower carbohydrate diet.

**Dr. Hyman:** Well that's the operative word there. If eat higher fat, if you have the bagel with the butter, that's not good, right?

**Chris:** Yeah, or the bun with the bun with the cheese burger.

**Dr. Hyman:** The bun with the cheese burger, that's not good. It's the bun...

**Chris:** And the fries, and the Big Gulp, and the ice cream.

**Dr. Hyman:** It's the sugar that turns the saturated fats into a problem, that's what I seem to have found.

**Chris:** That's right, that's traditionally that's the context that they've been eaten in, right? I mean most people are eating doughnuts and burgers with buns and...

**Dr. Hyman:** Fries yeah.

**Chris:** Everything combined and we don't... I think that, that's I'm really glad you brought that up because that's one of the big problems with a lot of the re-

search, the observational research is that they're just looking at saturated fat intake in the context of a standard American diet.

**Dr. Hyman:** Yeah, it's terrible.

**Chris:** They're not looking at someone maybe like me or other people who are eating all whole nutrient dense foods, who are also getting some saturated fat that happens to be in those foods, and in the in the few studies that we have had that have done better comparisons the relationship that's been proposed between saturated fat and heart disease is very weak. As a matter of fact there's an inverse relationship between saturated fat and stroke.

**Dr. Hyman:** Yeah, in Japan the Japanese study.

**Chris:** Yeah, even have a lower incidence of stroke.

**Dr. Hyman:** The problem with all these studies, we talk about is that there's population studies which don't look at cause and effect, they see patterns but you can't really draw firm conclusions from that and the studies that are actually interventional studies, we actually give people to food and follow them for years, and see what happens — those are far and few between and they're hard to do, one is use tell people eat this way, good luck, they're probably going to. The women's health initiative they were like, "Cut your fat from 38% to 20%." Well they didn't do it. They got to 29% which is still an improvement but like the critics will say, "Well you know of course didn't work because they didn't go to 10% fat, so that's why it didn't work."

And so we have a really mishmash of research which leaves you and I and the rest of the humans out there who haven't read as much stuff as we all confused and so we kind of have to patch together the evidence from human studies, from animal studies, from small trials, from interventional trials, from population studies, from basic science and come up with like a story that makes sense.

And so that's what's so great about what you do. It's what I try to do and it's like it's this rare that happens because you've got the scientists and also they actually just like focused on their little microcosm of their world and their work, which is allowed them to go deep, deep into these stories. But on the other hand they don't have the 30,000 foot view which is so great about what you do Chris.

**Chris:** I actually have these three pillars that together form a lens that I look through, and one is modern research and observational epidemiological research in clinical research. Another is an ancestral perspective which we can talk more about and then the third is clinical experience, and I think when you look at it from all three of those perspectives rather than just getting too myopic, myopically focused on one, you have a lot more balanced perspective and the people I respect like you and others who are looking at it from all of those different perspectives, instead of one. I often encounter writers are people who are super dogmatic about one idea and I say, "Well have you treated any patients? Have you like if you ever actually tried this in anyone other than yourself?" And if the answer is no I mean to be honest it's hard for me to really put a lot...

**Dr. Hyman:** It's true, it's true.

**Chris:** Faith in their opinion.

**Dr. Hyman:** It's true. I have seen I don't know 15,000, 20,000 patients over 30 years, and over the years I've tried low fat diets with them. I've tried high fat and I see even doing the same diets on different people with the same problem, there's different results. It's like how does that work. Like one person you give them 70% fat and their cholesterol bottoms out. It drops hundreds of points. Other people you give them butter and they like their cholesterol go right up.

**Chris:** That's true right through the roof.

**Dr. Hyman:** And I'm like what's up with that, and then what are the clinical implications. I think the message that you said really I just want to come back to and have you discuss a little more, is this concept of like this ancestral diet, and the concept of like the context of our diet. It's not just one ingredient, or one nutrient that matters, it's the entire context and like yeah if you eat saturated fat, and the context of the standard American diet with 152 pounds of sugar, and a 146 pounds of flour, yeah, it's not good for you.

And if you eat, if look on the data on meat I looked at all the data, I mean I wrote like 8,000 words on meat in my new book, dissecting all the research and it was like fascinating to look at, because it was like "Oh, well, the meat eaters have way more heart attacks so you should not eat meat." I'm like oh okay, well let's look at the studies, and well guess what?



The ones who ate meat, well they smoked more, they drank more, they ate more sugar, more sodas, they exercised less, they didn't eat any vegetables and ate junk food, well guess what? That's the entire recipe for heart attacks, so is it the meat or is it the rest of the stuff, and they say, "We control for variables" and I think that's no sense. You can't do that. There's a great book it was published in the '50's called How to Lie with Statistics.

**Chris:** Statistics... One of my favorites. I love it. Yeah, there's no way you're going to control for those, and we're not controlling for what we're not looking for, so microbiome for example what studies is controlling for the effects of these diets on the microbiome, none and as the more we know about that the more we know how important it is so totally agree.

**Dr. Hyman:** Okay, there's two big topics I want to dig in with you now, one is I want to talk about statins, and the second topic is I want to talk about fat and the microbiome, because it's tricky subject and I know you're into this, so I want to talk to you about that.

**Chris:** All right.

**Dr. Hyman:** It's a tricky subject and I think we can together dissect it. Let's talk about statins, because just to set the stage the general consensus in the medical community is the statins are God's gift to doctors and to human kind, and that we should basically put it in the water.

And we should get cholesterol as low as possible and that they're there are extraordinary effective and everybody should be on them including thirty year olds and kids now and old ladies, and old men and all of it so...

**Chris:** Probably our pets eventually.

**Dr. Hyman:** Yeah, our pets right, so actually they wanted to...they wanted to get an approval to sell them over the counter at McDonalds, it's like an anecdote to the burgers, I don't know, so how do you contextualize this mania about statins, where they show real benefit, where are the questions, and like what is the harm risk of this drugs, and who actually should be taking them and who shouldn't?

**Chris:** Okay yeah, so just to contextually again I think it's a really good example of the failure of conventional health care system, which as you well know,

Mark is not health care, it's disease management and so that anecdote of wanting to give statins to people in McDonald's just says a lot about the status of our health care system right? I mean maybe they shouldn't be there in the first place and maybe that's why they need statins in the first place there in theory.

But we can of course discuss just the realities of public health and all that, but focusing more on this statins and their effects. There was an analysis back in 2010 done by a doctor named David Newman, I'm not sure if you saw it Mark but they looked at two different populations, those with pre-existing heart disease so this is a secondary prevention. People who already had a heart attack and then they looked at people who've never had any evidence of heart disease before. So this primary prevention. Then the people and they did analysis of what happens when those two groups' takes statin for five years, so in the people who how to had already had a heart attack, 96% who took statins for five years saw no benefit at all.

**Dr. Hyman:** Who already had a heart attack?

**Chris:** Who already had a heart attack. That's the highest risk population of course, 1.2% which is 1 in 83 had their life lifespan extended. Meaning they were saved from a fatal heart attack by taking statins, but this was typically on the order of several months not several years.

2.6% were helped by preventing a repeat heart attack that's one in 39, but 10% were harmed by muscle damage, so you've got 96% with no benefit, 3.8% had some benefit and 10% had muscle damage and that's even in the highest risk population that statins are supposed to benefit from the most. Not really that impressive in my opinion. I mean certainly not as impressive as their sales statistics would lead you to believe.

**Dr. Hyman:** Right, right yeah I mean is that the number needed to treat data you're talking about right, yeah?

**Chris:** Yeah, but it's just an overall analysis of how many people, yeah the number you would need to treat but also specifically by category. What is the benefit that they're seeing? Life span, because if a drug prevents a heart attack but increases your risk of cancer and doesn't extend your life span, that's just disease substitution.

**Dr. Hyman:** So if you have a heart attack Chris, would you take a statin?

**Chris:** No, I probably I wouldn't.

**Dr. Hyman:** You'd probably won't get a heart attack though so.

**Chris:** Exactly, because what this doesn't pay any attention to is what are the other possibilities, so there was a study you probably saw on meditation and ask middle age African men who had already had a heart attack, and show that meditation reduce their risk of future heart attack by a greater margin than taking statins. So I'm going to choose that intervention if I have a choice.

**Dr. Hyman:** But you think...

**Chris:** The other population is the people who have no heart disease and this is the bigger population of people, and this is the population that the drug companies are really targeting.

**Dr. Hyman:** It's like 75% or more percent of people who are actually recommended to take statins.

**Chris:** Exactly.

**Dr. Hyman:** Who'd never had a heart attack and who may not even have that many risk factors?

**Chris:** Exactly, young woman for example you know 35, 40 year old woman, no family history. Total cholesterol maybe 210, 220 which I would argue it's actually probably normal for that age of a woman and 98% of these people who take statin for five years see no benefit at all, 1.6% are helped by preventing a heart attack and then 10% were harmed by muscle damage and 1.5% were harmed by developing diabetes.

**Dr. Hyman:** Right.

**Chris:** So you have an equal number that were harmed by developing diabetes that were by helped by preventing a heart attack. Again we're talking about disease substitution and what's one of the biggest risk factors for a heart attack.

**Dr. Hyman:** Diabetes.

**Chris:** So to me statins make no sense in people who've not had a heart attack. Someone who's had a heart attack and have familial hypercholesterolemia, that might require more consideration and then we get into more of an individual approach where your evaluated on a case by case basis, because that person may very well have a risk level if they have familial hypercholesterolemia, which means very, very high cholesterol and strong family history.

It may be that a statin makes sense in that case but I don't think we can extend that to all of the other populations.

**Dr. Hyman:** Yeah, it's tricky. I was doing a lot of research on this to and it was interesting. I'm a doctor, I see a lot of people taking statins and I try to convince them about the risks and the benefit's and I see a lot of people with muscle damage, I see a lot of people developing insulin resistance. I see like issues with neurological problems. I see all this stuff clinically.

**Chris:** Sexual dysfunction.

**Dr. Hyman:** Yeah, sexual dysfunction so these are real things. It's not like oh take an aspirin. That's got even risk, or let's say take vitamin C, well maybe we haven't proved that vitamin C is everything, or does everything but you could take it for 100 years nothing bad is going to happen to you right?

**Chris:** That's right, even at a higher dose and here's the thing too I know you know this but for the benefit of the listeners, the side effects of an adverse effect of statins are certainly under reported, and this is actually been studied by Dr. Beatrice Golomb of UC Berkeley here right next to me. And she's done some really interesting research showing that the extent to which the side effects are under reported is hugely significant.

**Dr. Hyman:** They are they are.

**Chris:** We're not just talking about a small amount, we're talking about a large amount because let's imagine a middle aged man who's a typically a person who sounds or prescribe for it, goes into the doctor after having been prescribed statins and goes, "Oh my muscles hurt or my libido is lower, or I'm having some sexual dysfunction."

Doctor's like, "You're just getting older." "We all have those symptoms and that's it." And so the doctor is not going to report it because in the doctor's mind

here he's read the pharmaceutical literature that says statins are safe and don't have side effects so...

**Dr. Hyman:** Yeah, yeah that's right Chris I mean I'm a practicing physician so I've seen so many people report this, and if it was a rare thing it wouldn't be a weekly occurrence that I talk to people and find that reaction, it would be rare and so yeah, you're right, and also you know these drugs can have benefited some people, but actually we found that the benefit may not always be from the lowering of the cholesterol, it's from the anti-inflammatory effects, the antioxidant effects that we didn't know about before.

So there's a lot of other ways to lower inflammation by eating the right diet. I think that's the key and if people say you have a lot of risk factors, if you have high blood pressure, if you're overweight, if you don't exercise, if you smoke. Yeah then there's benefit, well like guess what? Don't smoke, exercise, eat better, and lose weight.

**Chris:** Yeah, it's the wrong conversation and the wrong focus and of course I don't need to tell you this. You've been beating this drum for perhaps longer than anybody, but that's the biggest difference between Functional and conventional medicine. In conventional medicine it's like if you have a rock in your shoe and your foot hurts, in conventional medicine you just take Advil.

**Dr. Hyman:** Right.

**Chris:** In Functional Medicine you take the shoe off and dump the rock out. That's the thing...

**Dr. Hyman:** That's right, you figure out, that's it's so it's really root cause. Functional Medicine that's what you do Chris which is so great and I have this incredible community of Functional Medicine doctors, around the country and around the world and you're one of the leading doctors.

You're training people; you're thinking about things, you're forcing people to change the way think about health and disease. It's really awesome and you know what? That's what medicine is becoming unless you actually find a functional medicine doctor and get his perspective; you're not going to learn about this different way of thinking that's so critical.

So yeah I think the statins is a long conversation. I encourage people to read your...you've written a lot of sort of little e-books on this stuff that are great. It's a big section in my book on statins, and I think that I try to create a dispassionate view, but I'm biased.

I see what happens, I see that's it's not all about cholesterol and think people are freaked out if their cholesterol is high and I see it every day, people have bought the dogma that if your cholesterol is high you're in trouble, so I've got to take medicine.

**Chris:** Here's is one more thing I think we need to talk about which is truly from a Functional Medicine approach, high cholesterol is a symptom, it's not a disease and so if somebody comes in to me and they have my cholesterol, I'm thinking why is it high? Is it because they have thyroid hypo function.

We know that T3 is required to activate the LDL receptor and take out the circulation, so if you got someone with even sub-clinical hypothyroidism, they could have elevated cholesterol. Just correcting that problem, that underlying problem could lead to a reduction in their cholesterol, and in fact back in the '70s and '80s I think doctors were prescribing low doses of thyroid hormone for people with high cholesterol even if they didn't have clinical hypothyroidism.

Then we have a couple other things which are really interesting is the the connection between chronic infections and cholesterol. LDL particles are playing anti-microbial role, and so when we have a chronic infection especially a gut infection and the toxins like lipopolysaccharide escape the gut, and enter the bloodstream.

The liver will make more LDL particles to deal with that situation, so you'll see an increase in the LDLP. I can't tell you how many patients men have come in to me their main complaint is high cholesterol; they don't even have gut symptoms. I do gut testing; I find that they have a parasite or fungal overgrowth, or something like this and a leaky gut.

I fix their gut and their LDLP goes from like 2,300 to like 1,300 with no statin, no dietary change not even any supplements for high cholesterol, so I have a checklist of like six things that I look for when someone has high cholesterol, and we will systematically go through that list and address all of those.

**Dr. Hyman:** It's amazing, right?

**Chris:** Before I even consider anything to lower their cholesterol.

**Dr. Hyman:** Well, it's interesting and the other thing that I was reading a book on a vacation once, it was by Linus Pauling. It was like biochemistry book, and it was like...

**Chris:** That's like you and me, that's what we read on our vacation.

**Dr. Hyman:** You know, I admit it I'm kind of a nerd, but it's what makes me happy so I just want to know how things work. How do things work? Like that's what I want to know, like I keep asking the question why, why, why, and so I'm reading this and I'm like it was about the biochemistry of fructose metabolism, and how it affected things in the liver, and I'm like it was like light bulb went off and I was like makes acetyl coa which is goes into production of triglycerides.

It creates more lipid, so it's like this whole concept of the lipo genesis which means our liver actually is induced to produce abnormal cholesterol from eating sugar not fat, and that was like what I thought cholesterol came from eating butter and eggs, and fat, and it was like a big awakening for me and I was like, "Holy cow, this is just basic biochemistry."

It's like what I've learned in medical school but probably forgot and the rest of the medical community is totally ignoring, and this isn't like some quacky idea, this is basic bio chemistry, so the fascinating thing is like when you look at the biochemistry of fructose and sugar, when you eat it actually induces what we call atherogenic dyslipidemia so it may not be that you actually have high cholesterol even.

But you could have a really nasty cholesterol that actually is causing heart attacks, but it's you can have a cholesterol of 150, but you could have like 2,000 small particles. They could all be small. You could have very slow HDL, high triglycerides and all of that is actually what's driving heart disease, and that's a cholesterol pattern that is driven by eating sugar and refined carbs, and in some resistance and actually eating fat fixes it.

So you get a fatty liver one of the fascinating things I found I reached into my book that the way to reverse a fatty liver is eating saturated fat. It's like eating

coconut oil and like MCT oil and they literally can reverse fatty liver by giving people tons of fat, and then how do they get foie gras which is a fatty goose or duck liver that you eat at restaurants right.

Guess what? they force feed the ducks sugar, basically corn and carbs and then they get fatty liver, so like we know this but somehow it's sort of like it's not in the radar for doctors.

**Chris:** It's so important to because that pattern that you mentioned where the total cholesterol is normal or even low normal is dismissed, because that person going to the doctor and get a big pat on the back as they're leaving the office, because most doctors don't know unfortunately to test for LDL particle number, and the number of small more atherogenic particles or lipoprotein little a and those markers, which are arguably much, much more important than total cholesterol.

**Dr. Hyman:** Yeah exactly, so to take home on that is you guys out there listening there's a lab test that now is done by Lab Corp and Quest called NMR, or it's like nuclear magnetic resonance and it's actually looking at your cholesterol under an MRI machine, like mini MRI machine and it tells you so much that you would never know by looking at regular cholesterol test.

And if you look at a regular cholesterol test it's like a 20th century test. It's outdated, it shouldn't be done anymore. Everybody should have this. It's not that expensive. You can ask your doctor for it.

Chris: It's covered by insurance.

**Dr. Hyman:** It's covered by insurance, so like when you go to the doctor say, "Doctor, can have than NMR lipid test, because I want that and I don't want the regular one, and I want you to tell me what it means. And if you don't know what it means go look it up and help with this."

Because we're going to have on this...

**Chris:** Download my e-book on the diet-heart hypothesis.

**Dr. Hyman:** There you go.

**Chris:** It will tell you a little bit about what means there.



**Dr. Hyman:** Exactly, right. Yeah, it's so important and I think the way to fix that actually is eating more fat, and that's what I do for my patients who have this bad kind of cholesterol, I give them a lot of fat and really low sugar and refined carbs, and lots of vegetables and they do amazing.

Chris: Yeah, so that's so you take that one person who that's a lot of Americans right, that body type, overweight with either borderline high blood sugar, frankly high blood sugar, insulin leptin resistance. That's the most common problem but then there's another patient and I'm sure you have a lot of mark.

I have more of these because so many people who come to me are already pretty healthy fit Paleo type of dieters. I don't see a ton of overweight people in my practice which is unusual, but...

**Dr. Hyman:** You live in Berkley man. You live in California, they're all...it's like a selection process over there.

**Chris:** But so I get the person who switched to Paleo type of diet with more fat and their cholesterol went through the roof, and in that case I don't necessarily tell that person you need more fat, because eating more fat may actually take them in the wrong direction if their total cholesterol is 450.

**Dr. Hyman:** So what do you tell them?

**Chris:** I think we can agree that there's been too much focus on high total cholesterol, but that doesn't mean that I'm going to see a total cholesterol of 450 and just shrug it off. I mean there's obviously something that's not functioning well in that situation whether it's genetic or environmental lifestyle I want to address it.

**Dr. Hyman:** One of the interesting studies I came across when I was researching my book was this survey of all these hospitals around the country, where people had a heart attacks and they measured the cholesterol's of people who came in with a heart attack, and they think he looked like 500,000 admissions that was like 60% of all the heart attacks in America, or some crazy number like that.

And they found that like 70% of them had normal cholesterol and a huge chunk of them had even optimal LDL's under 100 or even under 70 and what but what they found a fascinating was that almost all of them like everything except

about 10% of them had HDLs that were low. Right and triglycerides that were high, so that pattern of high triglycerides and low HDL good cholesterol, that's that bad cholesterol pattern.

And you can have a totally normal LDL and totally normal total cholesterol, that's kind, a lot of totals in there but any way it's lot blah.

**Chris:** Are you sure you're not from California Mark?

**Dr. Hyman:** I might be totally from California, and so I was stunned when I read that, I'm like, "Wow that is really extraordinary and it's just ignored."

**Chris:** Yeah, so here's another interesting to statistic 90% of people with high cholesterol that go on that have a heart attack, have at least one other major risk factor for heart attacks, like high blood pressure, so even when there's high cholesterol it's not necessary...how do we know it's not just a bystander.

Just something that happened to be present because in nine out of 10 cases someone else has a major risk factor like high blood pressure which could very well be the precipitating event for the heart attack not the high cholesterol, so we have to be careful not to confuse as you said before correlation with causation.

I mean that's like research 101, that's the first thing we learn in our research methodology classes, but its amazing how often that is over looked.

**Dr. Hyman:** And the media just gets it wrong most of the time and they go for the headlines not reading between the lines, it's kind of a problem so think that's the thing about you and I, we like to read between the lines and see what's actually going on, so I want to now dig it into this next topic which is like a whole another can of worms, or maybe a can of bugs, the microbiome right.

And also I want to talk about the effect of fat on that, because it's kind of some questions about that, and the effect of what you've talked about a lot which is resistance starch, and like how do you eat a higher like fat and even higher protein diet, and not mess up your gut bugs, because I've seen literature where if you eat a lot meat and fat, it changes your flora and can actually create an adverse profile of bacteria that can increase inflammation, increase diabetes.

There's the work from Stan Hazen and clinic about TMAO and carnitine and

that gets converted to this compound, this inflammatory that causes heart attacks, and so I think people are scared about and confused, and I just I took a long time for me to figure this out, and I used a lot of your work to help me think through it.

So can you help us as listeners think about whether role of microbiome and all that.

**Chris:** Sure.

**Dr. Hyman:** I know it's about a two hour talk, I just asked you to...

**Chris:** Yeah, I was going to say where to begin, so I have a lot of problems I mean I have obviously great respect for Dr. Hazen, and then so the...other researchers that were on the paper but I have definitely some issues with the TMAO research and the connection between TMAO and heart disease, and the idea that eating meat and fat is the primary contributor to elevated TMAO.

Because one of the things that they didn't address in their paper and I still have yet to see them address is that the biggest dietary source of TMAO...

**Dr. Hyman:** Is fish.

**Chris:** Is fish by far. We're talking about orders of magnitude higher than meat. So if that's the case then why we aren't seeing studies that where people are keeling over and dying from excessive fish intake.

**Dr. Hyman:** It's actually the opposite Chris. All the data show that fish is protective and we should all be eating fish.

**Chris:** Absolutely the opposite and there's been a big focus on fish oil, and some studies lately that have suggested that fish oil may not be as beneficial for heart disease prevention as we thought, but the research has been clear all along about whole fish consumption and the connect and seafood and the connection between heart disease.

Something like a 17% reduction in total mortality, overall risk of death from eating seafood which is far greater than just about any other dietary factor that's ever been studied, so I think there's a lot more to the TMAO story. It gets pretty complex because there are some complex biochemistry involved, but if you

search for my name and TMAO there's a couple of articles that I've written on it if you're interested in it.

But the short version would be I don't find the evidence supporting the link between meat and fat consumption, and a gut microbiome that is a bad microbiome, or a microbiome that's inflammatory very convincing. I think we're seeing another situation here where if you look at people, if you take one person let's say they're eating a standard American diet, they're eating McDonald's, lots of fried foods and processed and refined foods and sugar, and refined carbs plus meat and fat.

Their microbiome is going to be a wreck but is it because of the meat and fat or is it because they're eating all of these acellular carbohydrates which we can come back to in a second. Highly processed and refined carbohydrates that have a ton of sugar accessible and they feed the bad bacteria in the upper gut, and that is what creates the microbiome that is disadvantageous, not the meat that those people are eating.

**Dr. Hyman:** Yeah, yeah so that's right.

**Chris:** So versus someone who's eating meat and pasture raised meat or wild caught fish, and then a lot of plant foods, non-starchy vegetables and some starchy plants and some nuts and seeds and even legumes that are rich in resistant starch that person's gut microbiome is going to look very good and I know anecdotally from talking with Jeff Leach from the human gut project, he can kind of identify like a Paleo type of diet on the DNA analysis of the microbiome that they do and it looks very similar to what you see and hunter gatherers or people who have eaten these traditional diets who have the sort of Shangri-La gut microbiome that you've actually over there trying to preserve right now for, because that's the last...

**Dr. Hyman:** It's like the poop archaeologist.

**Chris:** Yeah, the last normal human microbiome.

**Dr. Hyman:** Yeah, it's amazing so I want to come back to this the sort of study on Stan Hazen because I think you know I'm a Clinton Clinic he's an amazing scientist, but I did see problems with it. Like what they did was fascinating.

He took people who regular Americans and like meat eaters and then like the effect of the meat, and creating this toxic compounds, and then they took like a vegan and they found all the vegans, their bacteria, they didn't have that. Then like they convinced the vegan to eat a steak.

**Chris:** I know, I wondered how they did that.

**Dr. Hyman:** I was like that's impressive, okay that impressive. Anyway I then like, "What happened?" and then what happened was nothing happened. like the steak didn't bother them and it didn't create this toxic chemical so the take home wasn't don't eat stake, it is how do you have a microbiome that's more like plant based persons microbiome that has good bugs in it?

And I think that's why I joke about the Pegan diet, because it's really mostly plants with by volume right, not by calories but by volume your plate should be like 75% plant foods, and then 25% protein or the rest is fats, and I put the olive oil and other fats on my vegetables, so it really understanding that if you actually grow an inner garden that is healthy, you have much more resilience.

So that's really the key here, and I wanted you to talk a little bit about how do you grow a healthy inner garden in the context of diet that has meat and fat, because that's the concern people have.

**Chris:** Yeah, so the Sonnenburg's I believe, Justin Sonnenburg from Stanford, a microbiologist wrote a book about the microbiome.

**Dr. Hyman:** The Good Gut, the Good Gut. You should read it. Not you but I know you read but you out there all should read it, because it awesome. I gave a quote for it, but that's not why you should read it. It's a good book.

**Chris:** He's great and I think he coined the term macrobiotic accessible carbohydrates, and so this is what we need to be eating. These are carbohydrates that are not digested by humans by us. We don't break them down into glucose and fructose and absorb those molecules into our bloodstream, they stay undigested in our gut to all the way to the colon, where most of the beneficial and harmful bacteria that we have resides.

And then the bacteria metabolize these carbohydrates, and they produce things like short chain fatty acids, like butyrate which we know plays a potent role as

an amino regulatory regulator, it reduces inflammation, it promotes T regulatory cell differentiations.

**Dr. Hyman:** Helps heal leaky gut and arthritis and everything.

**Chris:** Tons of benefit's and so you're not...the way I like to explain it in lay person's terms to my patients, is every bite of food that you put in your mouth, you need to be thinking about how it's feeds you and how it feeds your gut bacteria.

**Dr. Hyman:** That's right.

**Chris:** Because you have to do both and so these microbiota accessible carbohydrates fall into a few three categories basically, soluble fibers which are found in a lot of plant foods.

**Dr. Hyman:** Like what, what's a practical...?

**Chris:** Fruits and vegetables, apples for example and pears are really rich in soluble fibers. Bananas have soluble fiber, berries have some soluble fiber. A lot of insoluble fiber too.

**Dr. Hyman:** Sounds like a hardship diet; I don't know bananas, berries, and apples.

**Chris:** Yeah, carrots, squash, zucchini.

**Dr. Hyman:** Love it.

**Chris:** All fresh vegetables and fruits and then we've got non-starch polysaccharide, so these are long chain carbohydrates that are not starch and these are things that you like inulin or fructooligosaccharides and you find them in things like onions or garlic, or Jerusalem artichokes, or leeks.

Some people might be familiar with the FODMAP approach. These are a lot of the FODMAPs are non-starch polysaccharides, so if you look at a list of FODMAPs which a lot of people are busy avoiding for...

**Dr. Hyman:** Because their guts or they're trying to starve...

**Chris:** Because their guts are really screwed up right but the FODMAPs are actually a lot of foods that will feed your beneficial gut bacteria, and as a side note

there's been a few studies that have shown that a long term low FODMAPs diet, I think this is going to get to your, one of your questions has an adverse effect on the gut flora.

And its one reason why a long term high fat diet, I don't think is necessarily a good idea for people who are concerned about their gut...

**Dr. Hyman:** Well it's better to fix the gut than, that's a whole other conversation.

**Chris:** And then eat those FODMAPs yeah so that's the second category and the third category you mentioned...

**Dr. Hyman:** That goes, a little bit goes along with the idea that like take an aspirin if you have a pebble in your shoe.

**Chris:** Exactly yeah like just get on the low FODMAP diet completely eliminates these foods for the rest of your life. Not only is that a huge bummer, I mean try eating at restaurant if you can eat onions or garlic.

**Dr. Hyman:** Bad news right.

**Chris:** Really difficult but yeah so the third category is resistant starch and this is a type of insoluble fiber that is actually fermentable build bio to gut bacteria. Some types of insoluble fiber are not very fermentable, they just they're bulking agents. They add bulk to the stool but they don't they're not fermented aggressively by bacteria.

**Dr. Hyman:** Like bran, like bran. Insoluble fiber.

**Chris:** Resistant starch, its interesting resistant starch is harder to find in the diet than these other categories that I mentioned. Probably was easier in our ancestors diet because they had, they ate a broader diversity of plant foods.

**Dr. Hyman:** And when you say resistance, resistant to digestion.

**Chris:** Exactly.

**Dr. Hyman:** By us.

**Chris:** By us.

**Dr. Hyman:** But it's digestible by the bacteria?

**Chris:** Our bacteria, particularly bifida bacteria which is one of the major classes of good bacteria and I love it, and the easiest two the easiest sources, dietary sources of resistance starch are legumes like lentils and potatoes. Just the old humble potato, the thing about potatoes is if you cook them and then cool them the type of starch changes to resistant starch, and then so like a summer potato salad for example.

It's not going to spike anyone's blood sugar because it's mostly resistant starch which you can convert into glucose, and you're going to be feeding your beneficial gut bacteria in the process.

**Dr. Hyman:** So cold potatoes is what we're talking about.

**Chris:** Cold potatoes and the more you warm them up and cool them the more resistant starch forms. So you can do that several times. You can do it with lentils and legumes are generally really good source of resistance starch.

**Dr. Hyman:** I've even seen them with rice, where you cook the rice with oil.

**Chris:** Yeah, white rice and then...

**Dr. Hyman:** And then you cool it...

**Chris:** Cool it.

**Dr. Hyman:** You don't eat and then you put a fridge overnight and then eat it, don't heat up to much and is also more resistant.

**Chris:** And you've got resistant starch, exactly, and I confirmed this with patients with blood sugar issues with the glucometer. They can tolerate potatoes that have been cooked and cooled, whereas if they have a potatoes that hasn't been it will spike up their blood sugar, so the other source would be green plantains, which are available on a lot of Latin food markets, and you can do is slice them out really thin and put them in a food dehydrator.

And you make green plantain chips and you can take those around as a snack, they're wonderful.

**Dr. Hyman:** Bob's Red Mill's potato starch, that's what I've been using, and it's like it tastes a little bit like potatoes. It's not a bad taste and you mix it in water and you drink it. And that really also helps I started using it just because I like



to experiment with stuff, and I found it really helps, and also helps like you have deeper sleep right?

**Chris:** That's an interesting thing.

**Dr. Hyman:** And how does that work?

**Chris:** About resistant starch. You see a lot of discussion about that and I think that's because it's gut brain connection. We know that our gut microbiota have a potent effect on neuro transmitter production and regulation, and there's even an entire theory about what causes depression. Now the inflammatory cytokine model of depression which holds it's mostly...

**Dr. Hyman:** Inflammation.

**Chris:** An inflammatory condition and that information is mostly coming from the gut.

**Dr. Hyman:** Exactly.

**Chris:** So, it's kind of a surprise to see that relationship.

**Dr. Hyman:** It's interesting about the resistant starch; when they think oh like Dr. Hyman why are you telling me potatoes starch. I think it was like the no carb sugar diet, what are you doing? And I'm like, "Well, it's a little more complicated and it doesn't actually get digested."

In fact when you look at the literature it actually improves insulin sensitivity, so it actually reverses diabetes, which is kind of weird.

**Chris:** And lowers cholesterol. Yeah, I've seen patients drop from fasting blood sugar in the pre-diabetic range, to totally normal fasting blood sugar from just resistant starch.

**Dr. Hyman:** Yeah, it's pretty amazing.

**Chris:** One thing I do want to mention is in my practice at least so the recommendation is often two to four tablespoons a day for resistant starch, but it's important for people anyone without any history of gut problems.

**Dr. Hyman:** Yeah, yeah it's a problem.

**Chris:** Start slowly.

**Dr. Hyman:** Yeah, you're going to have explosions right?

**Chris:** Yeah, start slowly and build up slowly. I had a patient who didn't get that memo who called me and told me that she was literally doubled up in pain. It was actually not funny for a week from taking four tablespoons of resistance starch in the first day.

**Dr. Hyman:** That's like a gorilla dose.

**Chris:** So be careful with that. Go very slowly but...

**Dr. Hyman:** Yeah, a little half a teaspoon and buildup to a few tablespoons a day.

**Chris:** That's also I think it the great thing about potatoes starch is easy. We can fit it into our routine but you can also make some of those foods into. Potatoes and legumes and so you get some additional benefits from those foods.

**Dr. Hyman:** That's great, so the other thing I just want to bring up is to talk about poop and the gut and all that, is as begin to do the research I was like oh, a lot of the studies that when they tried to sort of induce inflammation of the gut, they gave the rats like super high fat diets, and they got worse, and it causes metabolic syndrome.

And I'm like, "What's going on there?" I have some thoughts about it but I want to hear your take on that, because if you see that in literature like the metabolic end toxemia study, where they gave this rats high fat diets, and then they end up having inflammation and leaky gut, and in some resistance, and diabetes and how do you kind of make sense of that?

**Chris:** Yeah, at this point I'm not entirely sure how to make sense of that to be honest.

**Dr. Hyman:** Okay, I'll tell you. I won't put you on the spot. I'll tell you what I found out and you can tell me what you think about this, but when I began to look at it's like fat you eat. So when they did the studies they were using like corn oil and soy bean oil, and all these inflammatory omega six oils.

And it really altered the gut microbiome in a bad way, but when they actually gave them omega three fats and good saturated fats, that didn't actually happen.

It was actually fascinating to see that. There's not a ton of literature on it but when I dug around I found some interesting studies which sort of qualified it.

It's not like all fat will do that.

**Chris:** No, I agree I've seen those and I think that's right. I have seen a couple studies where they're even using higher quality fats and they experience that effect. I mean the most obvious thing is are we sure that rat digestion and gastrointestinal physiology is similar enough to humans that we can just extrapolate fat from rats to humans.

I'm not that sure about it, that's number one number two I totally agree, this goes back to the distinction between the quality of macro-nutrients versus the quantity. So we've been way to reductionist about this for too long where we just see a fat is a fat, and a carb is a carb, protein is a protein which is absurd.

You don't need a degree in science to realize that eating an avocado is going to have a different effect on your body, than completely rancid fried industrially processed seed oil, like corn oil or soybean oil or cottonseed oil. By the same token a sweet potato is not going to affect you in the same way as a donut.

**Dr. Hyman:** Right, or a bagel, or you know right.

**Chris:** So yeah so the third thing is quite honestly I do have some patients who have got issues that don't respond very well to a super high fat diet, and this is one of the situations where I might recommend a more moderate fat, moderate carbohydrate diet. I myself I don't just eat a super high fat diet.

I am not afraid of fat definitely not and I eat a fair amount of fat, but I would say like if you look at my plate pretty much every meal that I eat I'll have non starchy vegetables, some little bit of protein and fat that naturally occurs there, and all have some kind of starch plant like a sweet potato or maybe yucca or taro, or plantains or something like that.

It's pretty balanced, it's pretty kind of ho hum nothing special no extreme like I'm not counting my macro-nutrients. I'm just eating real food.

**Dr. Hyman:** That's right, I think that's the take home here, it's like if you focus quality foods within each category, then you don't have to worry about counting calories, counting carbs, counting fat grams, and you naturally eat the right diet.

Now if 80% of your plate was sweet potatoes that could be a problem right, but it's not and if you...

**Chris:** It's pretty hard to do that though for most people. I mean the thing that's interesting is I think that's why when you look at the studies on the Paleo diet and why it's so effective, is that it is kind of like just eat these foods don't count anything, don't worry about the percentage of this is, or the percentage of that.

Just eat until satiated with these this list of foods.

**Dr. Hyman:** Right, right.

**Chris:** It turns out that Paleo is more satiating per calorie than Mediterranean or low fat diet, so people get full faster. They feel satiated, they eat less.

**Dr. Hyman:** Eat less yes.

**Chris:** Without even trying and that's the Shangri-La for weight loss.

**Dr. Hyman:** Yeah, you don't have to be hungry.

**Chris:** To eat less without trying.

**Dr. Hyman:** Yeah, you don't need to take fen fen and get heart trouble right? suppress your appetite, so I want to sort of like can kind of end with this concept of sort this macro-nutrient balance issue, because I think if we sort of focus on the composition of our diet as opposed to the calories.

You're right we don't have to focus on it, so how would create that perfect meal. You kind of listed it, its a little protein, like green, non-starchy veggies, some starchy veggies. Right?

**Chris:** Yeah, that's for me that's what works really well like a little bit of protein, a lot of actually more non-starchy vegetables and then a serving of some kind of starchy plant, because I'm active back there you can see my treadmill desk, so even when I'm working I'm often walking.

**Dr. Hyman:** Impressive.

**Chris:** And I'm pretty lean I just have an active metabolism. I found that I just need more carbohydrates. I tried a low carb diet for a long time it didn't work well for me, so for me that's what it looks like, but I think the takeaway here

when you're talking about macro-nutrient ratios is that for some of my patients yeah, they absolutely do better on a low carb diet.

They just feel better that way and it leads to more mental clarity, it manages their weight and it just works for them.

**Dr. Hyman:** Right, exactly.

**Chris:** Then you've got someone over here, I have some patients who are like you know high level professional athletes, and they do highly glycolytic types of training that just burn through glucose like it's going...like there's nothing else and so they actually do better with like 50% of their calorie intake is carbohydrate.

But we're not talking about gels and all of the typical stuff that athletes use. They're eating higher quality nutrient dense whole food plant based carbohydrate sources.

**Dr. Hyman:** But it's true also that guys like Jeff Volek and Steve Phinney, who've done work on the art of low carbohydrate performance.

**Chris:** Peter Attia who's written about this. He's another low carb. Ben Greenfield they're all like ketogenic Jennick, guys who do well on very low carb diet.

**Dr. Hyman:** And athletes, high performance athletes, and so there's like whole range of human capacity to deal with things, and you have to find out what's right for you. That's really the end of the story.

**Chris:** I'll tell you if I think if I get to the end of my life and people say oh that Chris Kresser guy said you have to do what's right for you, and there's no one size fits all approach. I think will have accomplished my mission.

**Dr. Hyman:** That's great, awesome Chris. well I want to ask one more question which I think it's sort of always in the back of minds which is what about all those guys, like who are vegans and seem healthy, or guys like Rich Roll who runs five iron mans, in like seven days on like vegetables.

**Chris:** That guy is amazing. I like him a lot. He's such a nice guy.

**Dr. Hyman:** Yeah, you've got like the fork over knives story, where people lose hundreds of pounds and they reverse all sorts of diseases, and guys like Neil

Barnard who have published research showing that all these works, and so how do you contextualize that, because that's part of the story we are all trying to fix.

**Chris:** So I mean works like Dr. Ornish studies. It's just difficult to isolate what actually works when you're combining a lot of interventions, and it's awesome like if you get someone and you move them from standard American diet to a vegan diet let's say. Okay well you're eliminating generally processed and refined foods, flour, sugar.

**Dr. Hyman:** Or two liter bottles of soda.

**Chris:** Crappy meat cooked in inflammatory oils and restaurants. You're eliminating all the foods that we know are pro-inflammatory and cause problems, so is, are they...

**Dr. Hyman:** It's not actually what they are eating, it's maybe what they're not eating is what you're saying.

**Chris:** Exactly, that's my point are you improving their health because they're eating vegan or because they're not eating all the crap that they were eating before, so that's one way...one answer to the question and the... something that works in the short term may not work in the long term.

So there is such a thing as a therapeutic intervention that has a dramatic impact that over time becomes problematic, so I see...many years ago I got into macrobiotics and I was actually training with the macrobiotic chef, and we would cook for people who are really sick, and we would often see this phenomenon where people would start the macrobiotic diet from their standard American diet.

They would get better, they would feel a lot better and then months would pass and they'd start to develop dark circles under their eyes. Really pasty complexion. You're nodding your head.

**Dr. Hyman:** I've seen that. I've seen those people, yeah.

**Chris:** Yeah, yeah, and then what's happened is that what worked initially stops working overtime, because they start to develop nutrient deficiencies and things like that.

Not really good and then with Rich Roll and people like that, the first thing is that always outliers. There are always people that I think just due to their genetics and other factors that we may not even fully understand, would perform at extremely high level almost no matter what they do.

We all know people like this too.

**Dr. Hyman:** They're like anomalies.

**Chris:** Eat like crap. They're just anomalies so that there is that but the second thing is that for a vegetarian or vegan diet, the key thing that determines how someone is going to do on that diet is how well they how well they do converting precursors into more active forms of nutrients.

So let's take beta carotene, beta carotene doesn't really play an important role in the body but it is a precursor to retinol, which is the active form of vitamin A which plays an incredibly important role in the body. We can all convert some beta carotene retinol; actually there is a small percentage of people that can make that conversion at all.

And those are the people when they do a juice fast, they turn orange because of all the carrot juice.

**Dr. Hyman:** I might be that guy because I was like, "Why I'm palms all orange?" like I'm freaking...

**Chris:** Why are my palms orange?

**Dr. Hyman:** I'm drinking carrot juice every day.

**Chris:** Just might be why you feel better eating some animal products that have preform retinal in them.

Someone that can't make those convert so then you have alpha linoleic acid, which gets converted into EPA and DHA.

**Dr. Hyman:** Which is like flax, walnuts.

**Chris:** Flax, walnuts. Less than 3% or one half of 1% actually gets converted into DHA and that's in a healthy person, so you take a person who's deficient in the nutrients that are required for those enzymatic conversions, they're not go-

ing to make that well. You've got vitamin k1 that needs to be converted into vitamin k2.

Some people don't do that well so I would assume that Rich is awesome at those conversions.

**Dr. Hyman:** Or maybe he's taking vitamins?

**Chris:** Maybe he's taking vitamins too? We don't know that but yeah I'm willing to pause it that there are people out there that do those conversions really well. Those are the people who when they switch to a vegan or vegetarian diet they do well for a longer period of time, versus someone who switches to vegetarian or vegan diet and went in three months they're a total basket case. And we've all seen these people.

**Dr. Hyman:** And there's like low fat and high fat vegans, right? And I think they're quite different. there's been some new work by Dr. Jenkins from the University of Toronto, looking at high fat vegan diets actually having better impact on weight and health, and even lipid levels. Putting better lipid profiles by eating like avocados and olive oil, and nuts and all these stuff that people are afraid of when they eat low fat diets, right?

**Chris:** Yeah, and we, I mean at the end of the day human beings when we're healthy were pretty adaptable, and we have examples of people like the Tuka center and Papua New Guinea who ate 97% of their calories is carbohydrates. Pretty much they ate sweet potatoes with the few bugs that happen to be on the sweet potato. That was their diet.

And they were lean; they didn't have a high blood sugar, obesity any metabolic or health problems. No evidence of heart disease at all and then you've got on the other end of the spectrum people like the Maasai in Africa, and the Inuit in northern part of the world who eat very high fat diet, and also seem not to have those diseases.

But the difference is they weren't eating cheese doodles and drinking big gulps and sitting on their butt watching TV for eight hours a day.

**Dr. Hyman:** Exactly right. It's all the overall quality that matters at the end of the day what you're saying.



**Chris:** Quality that matters...

**Dr. Hyman:** Eat real food.

**Chris:** Real food and of course there are things we haven't even talked about like physical activity, and sleep, and stress management, and other ways that our lifestyle today differs from the ancestral norm for human beings that I think are equally significant, but we'll have to cover that on a on a different Summit.

**Dr. Hyman:** This is so great. I think Chris we could talk for hours. I know we could talk for hours.

**Chris:** We have.

**Dr. Hyman:** We have so is there anything you're excited about coming up. Anything you want to share with our audience about what you're doing?

**Chris:** Yeah, sure I just launched the Kresser Institute which is an organization that I am really excited about. I establish to train the next generation of practitioners who are interested in combining Functional Medicine with an ancestral perspective.

**Dr. Hyman:** So great.

**Chris:** That training is starting next year. We've already finished enrolling the first cohort and got 180 people from around the world doctors and naturopaths, and people of all different disciplines and I know you know this Mark with your role on the IFM, I just feel like my practice has been closed to new patients for the better part of the last four years.

**Dr. Hyman:** It's the biggest problem we have.

**Chris:** Yeah, there's only so much time and I think the biggest contribution I can make is to help get other people out there who are able to practice this kind of medicine.

**Dr. Hyman:** So important and we have 1,200 people on our waiting list at Cleveland Clinic. We are hiring doctors and nutritionists like crazy. We can't keep up with the demand. We have IFM courses in the Institute of Functional Medicine. They're oversold, we have to add, and we used to have like 20 people in a class once year.

Now we have 400 people, five times a year and we can only do that because we need preceptors and proctors, and we have to have the staff to come do it, so it's like we actually could do more and the modules are sold out. I can even get my friends in who are like, "Can you get in me into the course?" I'm like, "I know I'm the chairman but I can't. That's it like we're stuck."

**Chris:** Yeah, yeah. In a way it's a good problem to have but it's the work you're doing in Cleveland clinic, I'm so grateful because a lot of people say, "Oh well, this is the only way that's going to change is if we get this to be more legitimized." And what you're doing in the Cleveland clinic is such a huge step in that direction, so that we can start getting insurance companies and the conventional model to pay attention...

**Dr. Hyman:** its happening, it's happening. I just know United Health...

**Chris:** Figure out... If they can prevent diabetes from ever happening is somebody...

**Dr. Hyman:** It's happening Chris. It's happening, last week I was in Minneapolis and the United Health Group is there, and they asked me to come and they spent three hours with me. Like basically picking my brain and wanting to collaborate and figure out how to scale Functional Medicine, because they saw it as one of the greatest inventions of the future.

And I'm like, "Holy cow, this \$180 billion insurance company." and it's not like fighting down the door saying, "Hey listen to me. Like this is the future, like where are you come help, can you quit your job?" I'm like, "No, but let's figure it out."

**Chris:** But it's a no-brainer right? I mean if people really understand it, there's no one that's not going to get behind this, so it's really exciting and thank you so much for all of the work you've done. You've been such an inspiration for me and all of my patients and readers, and I'm just grateful to be a part of it in some small way.

**Dr. Hyman:** Thanks Chris. Well we're doing our part. Thank you so much and I would check out Chris's web site, [chriskresser.com](http://chriskresser.com), I'm with serious like on his blog listen I don't get a lot of junk mail because I don't like it, but this is the one I read and also all the little e-books and his book.

He's just a great source. He's got podcasts, like it's just deep. It's like if you're a nerd like us then you know that's the place to go. It's not light, it's like deep dive and I love it, so thank you Chris for contributing that to all of us and have an awesome day, and let's just keep on going with the conversation.

**Chris:** I'm right with you Mark, thank you.