

Announcer: Bulletproof Radio, a state of high performance.

Dave Asprey: You're listening to Bulletproof Radio with Dave Asprey. Today's cool fact of the day is yet again about gut bacteria because those little bastards are doing all sorts of things in your life that you probably didn't know. In this case, the gut bacteria have just upended hundreds of billions of dollars of, well, drug research, to put it in the best possible way. That's because a new study found that gut bacteria can modify huge numbers of drugs and the genetic makeup of your microbiota predicts your response to medications. The amazing scientists, who are only a little bit cowardly so they could get their next grant, said in the quote that they, "May predict your response to medications."

Even though they just freaking proved beyond any reasonable doubt that gut bacteria metabolize and change medications before your body can use them. However, they may predict, whatever that may be. Let's stop using weasel words, my friends. We just broke a lot of medical research. This is from Yale. They tested the ability of 76 kinds of bacteria, which is a selection of bacteria to represent the microbe diversity of the human gut. Although frankly, if you do it right, you can have more diversity. My number is 196. They found that 76 different type of bacteria mix altered the molecular structure of 271 oral drugs, everything from hormones to antiviral medications.

They did that in only 12 hours in test tubes. About two-thirds of the drugs they tested were modified by at least one strain of bacteria and each strain of bacteria could modify 11 to 95 different drugs. The next step was a series of experiments with different medications. They monitored the entire microbial population in fecal samples to see what it would do to the drugs. It turns out that it's one thing if Bacteria A does something to, say, an antibiotic. That's maybe a bad example. Say to Metformin.

If Bacteria A turns Metformin into something and Bacteria B turns that thing into something and Bacteria C turns it into something else that's toxic to Bacteria D that was responsible for making a good compound in your body, what you have is a system effect, a network effect. Everything in your body is actually a system. That's why systems biology is such an important thing to do. It requires massive amounts of computational abilities as well as interesting machine learning algorithms, as well as the ability to actually genetically sequence large numbers of bacteria. It's kind of cool. We can do this now. We couldn't do it 10 years ago.

What this means though is that pretty soon, your doctor's going to need to look at your poop to tell you whether any medication works for you or not. That means all those studies saying, "This medication does something for this population of people." It's probably BS. Just like this studies that say, "Oh, kale is good for you." You're like, "Oh, a third of people can't metabolize oxalic acid." For you guys, it could cause gout, kidney stones or my favorite condition you don't want from kale called vulvodinia.

That would be the formation of uric acid in the vulva in a woman, which is an exceptionally painful condition that results in, well, difficulty sitting down and wearing underwear and things like that. Go kale. All right. Today's guest is interesting because he's a doctor who says you don't have to eat your vegetables. If you've read some of my posts and all of you know I've gotten pretty deep on the "I didn't eat my vegetables either" path a while back. I'm talking about a guy named Paul Saladino, a certified functional medicine practitioner in Seattle who focuses on in-depth study of both behavior in humans and diseases.

He's pretty unusual because he's quite an explorer. He spent six years adventuring, hiking the Pacific Crest Trail, and became a Physician's Assistant. Practiced in cardiology, then became an MD, then became a functional medicine certified MD, and is now doing a psychiatric residency, which is a very unusual path. What's the root cause of why we do what we do? What can we do beyond pharmacology? He's probably best known because he talks about nutritional biochemistry and the Carnivore Diet, which is our main focus. Welcome to the show, Paul.

Paul Saladino: It's so good to be here, my friend.

Dave Asprey: Now I just realized, you're in Seattle.

Paul Saladino: I am in Seattle.

Dave Asprey: What a waste. I was in Seattle yesterday. Why didn't I just interview you in person?

Paul Saladino: I would have loved that.

Dave Asprey: Next time we are both in Seattle at the same time, let's go to Carnivore, the restaurant. Have you been there?

Paul Saladino: I would love to do that. I have not been there but I'll tell you what, Dave. I am moving to San Diego in one week.

Dave Asprey: Well, you suck. Too bad. No. I'm just kidding. I love San Diego, too. I'm down there pretty frequently. I have a bunch of friends there. Carnivore in Seattle has a lot of grass-fed meat. The founder shut down a couple of bars after reading the Bulletproof Diet benefiting and you go there and she'll tell you, "I hunted this deer myself," and things like that before you eat. It's cool. Maybe in your one week of time left, you can do it.

Paul Saladino: Maybe so.

Dave Asprey: All right. Before we get into the cool Carnivore Diet things, one of the things that attracted me to having you on the show was that when you hiked the 2700-

mile Pacific Crest Trail from Mexico to Canada, you did something that a few people have done. Everyone I know who's done it always talks about this incredible focus on fuel and efficiency and how you feel every day. Because all you have is just 12 hours of walking every day. Did I walk well? Did it hurt? Did it not hurt? Was I tired? Those sorts of things become top of mind. What did you learn that you didn't expect to learn when you walked the trail?

Paul Saladino: Pacific Crest Trail was an incredible experience. There were many lessons that I learned on the PCT regarding food. What I learned was that I never got sick of animal foods. This is probably something that you maybe weren't even anticipating me saying. As I was going through the trail, I had packed all of my food for the trail and send it to myself at 27 resupplies along the route. I got so sick of every single thing I had sent myself but I never got sick of jerky or other animal foods. I look forward to those the whole time. Believe it or not, I got sick of peanut butter.

Dave Asprey: Yeah.

Paul Saladino: I never thought I would get sick of peanut butter. This was years ago, mind you. This was 20 years ago that I hiked the Pacific Crest Trail. I had no inkling of a nose to tail Carnivore Diet in my mind at that time. In retrospect, a little bit of foreshadowing there. I got sick of every food that I packed. Granted, I was trying to pack whole foods. I wasn't trying to pack processed foods. I was trying to eat as well as I could imagine at that time during the Pacific Crest Trail. All I wanted to eat were animal foods after the first thousand miles or so.

Dave Asprey: It's pretty well-known. My dad was a long distance backpacker more than I was. I've done some decent hikes including Annapurna circuit and stuff like that. People oftentimes resort to carrying sticks of butter or gee or little bottles of olive oil. I'll just take a couple of swigs because the caloric density of straight oil is about as good as it gets. At a certain point, you are turning food into electrons. More electrons in your food, the more you can make of them when you don't want to carry a bunch of carbohydrate empty calories there even if there's some nutrients in them or not. It doesn't really matter.

They're empty calories because they have less calories per gram than fat. In fact, is that the new definition of empty calorie?

Paul Saladino: Anything that's less than fat is empty?

Dave Asprey: Pretty much.

Paul Saladino: We need calories. Those are weeny calories.

Dave Asprey: Nice. Although I hate to say it but if you're eating nose to tail, never mind. That's why they have hotdogs. Okay. You learned that you wanted jerky but you got tired of peanut butter and you got tired of crackers and dehydrated noodles and

all the other crap to eat. I found the more I got into just controlling how I felt that when I would go backpacking, I looked at what was in the processed garbage that they serve and say, "I'm not going to do this." I would find myself like you, eating jerky. I found a way to for about a week, to preserve a hunk of filet mignon.

If you dehydrated it with enough stuff on the outside of it, it would essentially be something that you could cook and store for an amazing amount of time. I just stopped eating the garbage and my performance went up. My knees didn't hurt. I felt so much better to the point that even I was into bed, I never had some protein powder. I had certain types of nuts and things that worked much better than the local ramen. You discovered that. What got you into the carnivore side of things? That's pretty out there. I've been following this phase for a long time. I've dabbled but you're not just dabbling.

Like, "I've got a medical degree and I'm telling you to throw down your vegetables." You're famous for saying, "Every vegetable positive has a higher net negative." How did you get there from I hiked the PCT eating peanut butter?

Paul Saladino: It's an interesting journey. I think it has all been based on the fact that I am fascinated by what makes things work and what makes things not work. I think that perhaps a little bit like you, I'm probably an engineer at heart. Maybe a mechanic. I really see myself as a human mechanic rather than a physician. Throughout my training when I was a physician assistant, I began to realize this and then I went back to medical school at the University of Arizona because I was dissatisfied with the paradigm that I saw as a physician assistant. I don't think anyone will argue with me when I suggest that most of Western medicine just looks to ameliorate symptoms with pharmaceuticals.

Dave Asprey: Yeah.

Paul Saladino: That wasn't interesting to me or satisfying. It didn't feel good in my gut and my heart. I wanted to understand what was causing patients to be sick at the root and be able to affect that. That's been the driving factor for me throughout my education. That's really led me to some strange and wild jungle holes of thought. I was a physician assistant working in cardiology. Quickly realized that giving people Statins and beta inhibitors and adrenergic receptor blockers was not correcting the root cause of their illness. There had to be something else going on.

I'm going to back to medical school. It was about at that point that I discovered functional medicine, which is root cause-based medicine and began to explore the thinking in functional medicine and the tools that functional medicines had to address what might be root causes. Functional medicine talks about elimination diets. It talks about food allergy. It talks about gut flora, inflammatory organisms in the gut, toxic metals. I thought, "Okay. That's a good start." I did everything I could from a functional medicine perspective for many

of my patients and they just still weren't getting better in the way that I hoped they would.

What I saw in medical school, what I saw in residency, which I'm finishing this week, by the way.

Dave Asprey: Congrats.

Paul Saladino: Yeah. I'm done. I've been at the University of Washington for four years. I'm finishing residency this week and as I mentioned, I move up into San Diego to open a private practice there and surf a lot. It was this constant disillusionment, this constant disappointment like, "I am doing everything that I think is right and people are still not getting better." What I saw persisting was chronic inflammation and autoimmunity. I would argue that those are essentially synonyms. That autoimmunity is chronic inflammation. That what we're dealing with in Western medicine is a tidal wave of chronic inflammation, a tidal wave of autoimmunity.

Dave Asprey: Do you think they're really the same? Identical?

Paul Saladino: Essentially, right? It's synonymous.

Dave Asprey: You can cause chronic inflammation by inhibiting mitochondrial function without triggering any immune behaviors.

Paul Saladino: I think there's a lot of the signals from the immune system come from the mitochondria. That's what reactive oxygen species do. They affect everything. It's hard to trigger mitochondrial dysfunction and not get cytokine abnormalities. The immune system's always talking.

Dave Asprey: Are cytokine abnormalities autoimmunity? are they just cytokine abnormalities?

Paul Saladino: If you're having cytokine abnormalities, then the immune cells are talking to each other in a different way. It's a little bit of new-

Dave Asprey: I see what you're saying. Basically, the presence of extra free radicals. It may not be classical autoimmunity where you've got antibodies to your thyroid. It isn't going to happen if you inhibited mitochondrial function for a short period using hydrogen sulfide or something.

Paul Saladino: Right.

Dave Asprey: Okay.

Paul Saladino: If we're thinking about both innate and adaptive immune responses, you can get those adaptive immune responses or typically what we think of as traditional autoimmunity. I would argue that innate immune response dendritic

cells, macrophages, that's autoimmunity, too. That gets to this broader definition of autoimmunity. The immune system is involved and dysregulated.

Dave Asprey: Okay.

Paul Saladino: It's all connected.

Dave Asprey: Yeah, dysregulated immune system. I like it. Maybe I just have a too strict of a semantic definition. If you're listening and you're like, "What are you dorks talking about?" Here's the deal. It doesn't matter if your body is attacking a specific part of the body. The immune system attack a specific part of the body versus the immune system is jacked up so you have inflammation everywhere. Bottom line is, I would agree very much with what Paul is saying here, which is that if you have inflammation everywhere, things are broken. You better fix it.

You can call it whatever you want to call it including unicorn flu. You better solve the inflammation problem. When you do that, everything else gets into alignment. Am I finding a common ground there?

Paul Saladino: Absolutely.

Dave Asprey: All right.

Paul Saladino: Absolutely, yup. Electronic high five. Boom.

Dave Asprey: Nice.

Paul Saladino: Maybe just gave it to your knuckles through the internet. Yes. What I became more and more focused on was interventions that I could use to modulate inflammation autoimmunity. When I quickly realized even early on in my training when I was at medical school was that food was the lever that I was most fascinated by. Food was the main thing. You can do-

Dave Asprey: Biggest lever.

Paul Saladino: It's the biggest lever. Food is a huge, huge lever. That's been the iteration in my mind is am I built to eat? How are humans built to eat? That was really what led me to hypotheses around a Carnivore Diet. Thinking, "Wait a minute. Maybe this is the idea." Maybe this is what's going on here that we have been in this arms race with plants as humans for millions of years. We had this evolutionary history coming from primates where we were eating a lot of vegetable and plant matter moving to humans as homo sapiens while previous homo erectus and homo habilis four million to two million years ago.

We saw this huge expansion of the human brain and that was because we were eating animals most likely. This is all hypothetical but so many convincing theories now that it was animal nutrients, density of calories that allowed our

brains to just grow in size. Humans regenerate a neocortex to move out of the trees and become hunters. There was something magical about eating animals. I heard these stories, yeah.

Dave Asprey: There's something magical about cooking them, too.

Paul Saladino: We can talk about that.

Dave Asprey: Yeah. I want to go there with you.

Paul Saladino: Yeah, yeah, we should. There are these theories about the cooking of food. I have some interesting thoughts about that, too. As I was mulling over that, I hear Jordan Peterson and Mikhaila Peterson talking on Joe Rogan about the improvement in their recalcitrant autoimmune conditions by eliminating plants from their diet. I thought, "That's really cool." Throughout the history of my training, I've always been fascinated by any intervention. Whether it was a vegan diet or Bulletproof Diet or a Paleo diet or any of these things that helped people anecdotally and have won case study improve autoimmunity, improve chronic inflammation.

I want to study that. I want to study that and see what's going on there. All those are valuable anecdotes. When I heard about this with a Carnivore Diet and we can talk about how I've formulated Carnivore Diet for me. It's much more than just meat. It's like this nose to tail as you suggested. That was really fascinating to me and I went down that rabbit hole. I've just been on this magical unicorn journey. It's been a great experience. It's led me to learn about all sorts of cool things as I'm exploring this hypothesis that for some people, for all people, plants are out to get us. They don't want us to eat them.

It comes with all these corollary questions which I'm sure we'll dive into. That perhaps animals really are the source of the optimal food for humans.

Dave Asprey: I love the mindset that plants don't want us to eat them. I go back to emergent behaviors from complex systems. There's a guy named Stephen Wolfram who proved, this is the guy who created Mathematica, which is this math stimulation software used in almost all advanced engineering and science and biology degrees to model behaviors. He showed, "Look, you want to make something that looks like a really amazing complex flower? You take these four rules and just do them over and over." Billions or trillions of times and these amazing complex patterns emerge from simple rules. I think that the basic plant emergent behavior is I can't run away because I'm rooted.

Number one rule is don't die, which means don't get eaten. This is why. If you're listening to this, you're like, "Dave, what's up with this?" I'm going to tell you is go outside. Find any plant around you, just a tree, a weed. Take a handful of it, put it in your mouth and chew it and see what happens. The vast majority of

plants, you could die. You will shit yourself silly. You could go to the hospital. No joke. That's how strong of a pattern this is.

Paul Saladino: Totally true.

Dave Asprey: There's credibility here. There's a reason. There's an explanation and then there's a test that we can all do that I don't recommend you do because you'll feel really unwell. One leaf of certain plants, in fact, the very common plants will give you really severe gut cramps. Please listen to what we're talking about here because this is the world you live in. You just never thought of it that way. All right. Assuming we got our listeners past that first, "What the heck is going on here?" I was a raw vegan. I'm going to call myself a devout raw vegan. I tried everything.

I swallowed an electrical stimulation device, a tens device from Russia to see if I could increase peristalsis. My digestion had been ruined by 15 years of antibiotics. In the raw vegan diet, I felt good for a little while and it really wrecked my health over time. I said, "All right. I am familiar with this grass-fed stuff." In the very early days, grass-fed and all. I said, "I'm going to go back to being omnivorous but raw still has to matter." I ate raw meat. I ate raw steak. I'd marinate it in vinegar sometimes. I ate raw eggs, raw fish, raw lamb, raw pork. Probably not a really good idea unless you know where it's from, and raw chicken.

I actually did do it a few times but it's a stupid thing to do. I think eating raw chicken is just a terrible idea because of the amount of viruses that chicken have. Let's think dinosaurs, they're not that compatible with you. Of all that stuff, I went to a place where you couldn't get raw meat and I started eating cooked meat again albeit to that and just decided it wasn't worth it. Having gone down the path of raw versus cooked meat and the original all carnivore guy was Angelo von der or whatever. I can never say his name right but you know his name.

Paul Saladino: Aajonus Vonderplanitz.

Dave Asprey: Sorry. You must have come across the raw Carnivore Diet before you settled on a nose to tail Carnivore Diet where you are now. Why do you cook your meat?

Paul Saladino: This is a very interesting question. It has many corollary discussions connected with it. I think that in today's day and age, we basically cook our meat for cleanliness. To eliminate our pathogens on the surface of the meat. I will tell you that I eat raw egg yolks fairly commonly with reckless abandon and much enjoyment. In fact, I eat raw duck egg yolks.

Dave Asprey: Yeah, me, too.

Paul Saladino: Yeah. They're amazing.

Dave Asprey: It's like ice cream.

Paul Saladino: They're fantastic. You can almost cut them with a knife. They're so viscous and rich. I don't eat the white raw because of this compound avidin and the white biotins by it. I don't think raw chicken or duck white are compatible. I eat the yolks raw because it tastes better that way. Many of the compounds in the yolk are at least partially heat lay bio degraded by heat. I just find it to be simple and easy. I also do eat raw liver from time to time fairly frequently.

Dave Asprey: That's disgusting.

Paul Saladino: It's really good, Dave.

Dave Asprey: You like it?

Paul Saladino: Yes. Yeah. It's grown on me. There's a whole hashtag on Instagram now, #frozenlivergame.

Dave Asprey: Yeah. I used to do that. For years, I'd freeze my chunks of liver.

Paul Saladino: Yeah.

Dave Asprey: I still started taking powdered liver, desiccated liver capsules because it's easier. The reason I think it's gross is I would take slices when I was a raw omnivore and I never liked it. One time I said, "I could just take this whole young lamb liver." I put it in a blender with some vinegar and some water and I added some salt maybe. Blended it up and then went to drink it. It was even worse than before. As I was drinking it, one of those stringy bits of connective tissues caught halfway to my teeth. I still have nightmares about raw liver. You freeze and take it as capsules but do you have some recipe for raw liver to make you happy?

Paul Saladino: No. You just eat it like the primal caveman that you are.

Dave Asprey: You're more of a man than I am.

Paul Saladino: Thanks, brother. I'll tell people about raw liver because as a physician, it's very tenuous. I do not recommend eating raw liver to anyone because you will get sick. It is something that I have experimented with. I would go to the butcher and I learn about the diseases that cows can get in their liver. There are liver flukes but what I learned is that you can see when the fluke is in the liver. There are scars. There are streaks. It teaches me about what a healthy animal liver looks like. You can see if the liver's healthy then you freeze it for a certain amount of time. Just like you might do with salmon to eliminate pathogens.

People don't need to eat liver raw in order to get the nutrients. We will talk about nose to tail carnivore. Liver is very nutritious even cooked.

Dave Asprey: Yeah.

Paul Saladino: The desiccated capsules are great I think but I think of myself as the astronaut. I'm going to the carnivore moon.

Dave Asprey: We got to try it, right?

Paul Saladino: Yeah. The carnivore moon is made of raw liver just in case people want to know. I thought they're exploring it.

Dave Asprey: It's like grass-fed cheese?

Paul Saladino: I eat cheese. Carnivore moon is the roller. I want to go back. I want to explore and bring things back. I do eat most of my eat cooked but I will eat my steaks pretty darn rare. Not always blue rare but mid rare, things like that, especially if it's a really good quality steak like a Wagyu or something like that. Now basically, what I'm doing there is I'm just searing the outside of the meat to get rid of any bacteria that are on the outside of the meat. Often, I'm not heating the interior of the meat far enough to kill things that are in the inside of the meat.

I think that most meat in the United States is a pine of quality especially the grass-fed organic stuff that I'm seeking out. Because I am trying to get really good meat that you're not going to find any real pathogens in the meat. They do occur but in the herds in the US, they're very rare.

Dave Asprey: Okay.

Paul Saladino: I'm basically sterilizing the outside of the meat and that's it.

Dave Asprey: What I would do when I was really doing the raw thing heavily is I would make iodine tinctures. I'd put in a few drops of Lugol's iodine in water. I drop the steak into the water and slush it around for a little while. That is how you sterilize water that might have a little bit of poop in it. As a backpacker, you know very well how to use iodine to sterilize water. You can sterilize your meat, too, as long as you're only worried about the surface.

Paul Saladino: I think this brings up the interesting discussion of polycyclic aromatic hydrocarbons. We don't have to go down the rabbit hole too deeply but it's something that I talk about with Carnivore Diets.

Dave Asprey: Absolutely.

Paul Saladino: I was on another podcast and the person I was on the podcast with said, "Oh, he doesn't believe in those." I said, "Yes, I do. We need to think about the way that these molecules that are formed by cooking on the surface of the meat affect us as humans." What I recommend to people is they're aware they shouldn't be

charring their meat. We should to strategies to mitigate the amount of polycyclic aromatic hydrocarbons.

Dave Asprey: Yeah. It's part of the Bulletproof Diet. Yeah.

Paul Saladino: Yeah, yeah.

Dave Asprey: Cooking matters. Who would have thought that deep frying something or cooking it at 1100 degrees might create a different outcome than gently cooking it at 200 degrees? It's just chemistry.

Paul Saladino: Yeah. Yeah. Chemistry rules. It's fun.

Dave Asprey: I love it that you're talking about this. That's one of the concerns I have with Paleo and even just Keto. "Yeah, barbecue time." They go out there and they're eating massive amounts of just meat, just the muscle meat. They're burning it and they're cooking it in ways that really are not going to lead to anything but cancer. How worried about PAH is and PCAs are you?

Paul Saladino: I'm very worried about them. I take many steps intentionally in my life to mitigate and to really, really limit my own exposure. I've seen a number of guys in this phase talk about these trager smokers. A lot of guys I'm good friends with talk about them. I'm thinking, "No. It's a horrible idea."

Dave Asprey: Bad news.

Paul Saladino: That's a bad idea.

Dave Asprey: Yeah.

Paul Saladino: Bad idea. I don't even grill my meat anymore. Again, people are going to say, "You're puritanical. You're eliminating all the pleasure from the meat." My goal in the space is to try and get the most optimal nutritious food without any of the toxins. That's the whole reason I don't eat plants. When I cook the meat, I'm either going to do sou vied in a non-plastic bag like one of these Stasher bags that doesn't have polyethylene. Although those may have issues as well. I'm going to slow cook it in water or I'm just going to sear it on the pan for a moment. Maybe I'm going to try your method and do the Lugol's which is sterilize the outside of the meat.

I definitely do eat meat raw fairly commonly, just completely raw. I was over at Mike Mutzel's house last night having dinner with he and Ben Lynch and we just all ate raw steak and it was fantastic. It was so funny because Ben Lynch, people may know him from the book, Dirty Genes and-

Dave Asprey: Yeah. He's been on.

Paul Saladino: Yeah, MTHFR and he had this raw meat. He hadn't had it before. I posted it on my Instagram, he was like, "Oh, man. I feel high." I thought it was so cool

Dave Asprey: Two ounces of raw meat from a good grass-fed animal, you get energy and you're full. I used to slice it real thin on salads like carpaccio style. Yeah. I haven't done it in a while just for convenience and all. Now that I have my own sheep, it wouldn't be that hard to just have sheep on the cob. I could just walk out there and take a bite. Let it free again.

Paul Saladino: I think it's great. I think people should definitely be thinking about this. I'm going to piss on a lot of campfires right now when I just say that smoking your meat, closing the barbecue, grilling, these are not the way to cook your meat.

Dave Asprey: All right. I'm going to double down on that. I don't know that I've confessed this in public. I tossed my grill more than 10 years ago for that reason. I just did a video on how to minimize toxins from grilling. If you're going to grill, here's how to do it. News flash. You take a big piece of metal, like a metal griddle. You're going to be able to iron on the griddle but at least it's protecting your food from most of the crap that comes off the fire and sticks to the fat. When I want a nice, smoky flavor, it's shocking what you can do. You take salt, Himalayan salt or something that has been smoked.

Because when you smoke salt, the smoke that goes into that isn't the stuff that sticks to fat. I went really deep and did research on this. Smoked salt that's made properly is okay. Liquid smoke is usually not okay because they put fat in the liquid smoke. It just comes down to chemistry. I can get a smoky flavor. I could do it in the oven. It's healthier. I can put it in the sous vie. It works. The outcome in health is so important. When I see a smoked meat, I'm like, "I don't want to eat it because I can tell my inflammation the next day." Do you feel it in one dose?

Paul Saladino: I feel it. I hadn't talked about this with people but I'll share it with the community now. I've been doing exclusively raw for the last three weeks as an experiment.

Dave Asprey: Nice. Okay.

Paul Saladino: Yeah. You'll appreciate this. We're both astronauts in this phase. I don't know that I'll do exclusively raw long term but I'm going to re-measure my oxidative stress markers. I'm going to measure F2 isoprostane. I'm going to measure malondialdehyde.

Dave Asprey: I can't wait.

Paul Saladino: 8-Hydroxy, I really like eating all of my meat raw right now, Dave. As a doctor, it's like, "It's too hot for television. I can't tell people I'm doing that." The caveat-

Dave Asprey: You feel really good.

Paul Saladino: You feel really good. You feel really good, yeah.

Dave Asprey: When I did this, Jesus, going way back, I would eat only raw butter. Are you doing any butter? Are you just doing meat?

Paul Saladino: I don't do dairy. I'm happy to talk about what I eat. I am writing a book, which is called The Carnivore Code. It's going to be super awesome. I just wrote the chapter on lectins. In that chapter, I talked about A1 versus A2 dairy.

Dave Asprey: Yeah.

Paul Saladino: I'm completely convinced or at least very of the opinion that A1 is not a good thing for humans. I just cut dairy out of my diet completely. What I recommend if people are going to try, they do at least 30 days with no dairy at all. Butter actually has a decent amount of AGE, so advanced glycation end products in it as well. I don't do any of those things.

Dave Asprey: Doesn't that depend on how it's processed?

Paul Saladino: Yes.

Dave Asprey: Yeah.

Paul Saladino: Yes.

Dave Asprey: I've looked really deeply into the whole butter thing. I tell people, gee, milk fat has a lot of stuff that's beneficial for you in it. It's essentially animal fat, the way it's composed. There is some AGE in butter. However, there's much less than you're going to get from most of the cooked food you eat.

Paul Saladino: Yes or bacon. One of the things that I say, "Don't overeat that." People think, "Carnivore. This is great. I can just see bacon in there and steak for the rest of my life." I'm thinking, "That's not the way to do it if you're trying to leverage health." Bacon, because it's cooked in its fat has a lot of these AGEs.

Dave Asprey: Bacon is relatively easy to fix. Number one. If you can get a pastured pig, that's great. I know I have 10 of them in my farm so I'm a little spoiled because I get to cure my own bacon. Most people, if you can hear your bacon cooking, you're doing it wrong. That's the most important thing. Having vanishingly small amounts of lipid antioxidants when you're cooking, things like, "Oh, I don't know. Vitamin E?" Just a very small amount of Vitamin E. You want to go out there in the anti-aging. You can add Butylated hydroxytoluene or BHT, which was an anti-aging substance but now, it's a demonized synthetic antioxidant food preservative.

I think that preventing the damage in your fat is good. Now I'm going to really piss you off. Are you ready?

Paul Saladino: Me?

Dave Asprey: Rosemary. Rosemary extract is a great lipid antioxidant.

Paul Saladino: Don't say it, Dave. Don't say it.

Dave Asprey: I know it comes from plants. It's a bad thing. I'm just kidding. Rosemary is documented so is oregano in studies to inhibit lipid pro oxidation. If you slow cook your bacon so that the fat is undamaged, there was no smoke. You don't have to worry about burning yourself. You're outcomes will be very different but your bacon won't be crispy. You have to know this. Not you but just everyone who's going to eat has to know this. Otherwise, screw the bacon. It's bad for you but it's a religious experience when it's done right.

Paul Saladino: That's amazing. I think that's what this podcast is about and why it's cool to be spreading the message. We're not telling people to remove all pleasure from their life. I think what's cool is to be able to deliver knowledge that creates power leveraging this for better health outcomes and say, "If I'm going to do it, I should do it this way. If I'm going to eat meat, I should eat it this way versus that way." Because these things are important to know. If people want a goal of optimal health and longevity and performance, then this is the way to do it. To be informed and to be intentional about how you're cooking and eating food.

Dave Asprey: Yeah. We're not saying you're going to die if you cook your bacon hot and smoke something for a long period of time. You just might live less, which is a very different animal. Your quality of life may go down.

Paul Saladino: Yeah.

Dave Asprey: Your life may eventually go down but you might have a lot of pleasure right now, which is you're not the end of the world.

Paul Saladino: Pleasure now, pleasure long term. It's a balance. It's all about quality of life. People need to make their decision.

Dave Asprey: One thing that I've noticed because I'm definitely a connoisseur of grass-fed meat and have been for many years, I've sampled it from around the world. Now, I have to look at the quality of the grass that my animals eat because I get to eat the animals. When you get a properly fed animal and you don't burn it and you eat it, there's a food high. The biggest food high that I know how to get comes from pork belly from a properly raised pig. Pigs have the same detox organs as humans. They put almost everything through the ineffective kidneys instead of through the liver, which is why pigs accumulate toxins the way humans do.

We both suck at detoxing. This is one reason you probably don't want to eat pig kidneys and liver amongst many other reasons including viruses and stuff. When you get that pork belly and you cook it just right and you eat just a normal amount of it, for several hours afterwards, instead of like the sugary buzz or the caffeine buzz, there's this feeling of just like, "I could do anything I want to do right now." What is your go-to meat that produces that super human feeling?

Paul Saladino: It is a combination. I had this last night with Mike and Ben. It's a combination of a good quality filet that's raw and animal fat. Have you had raw suet? People are thinking I'm a nut case now but have you had raw animal fat?

Dave Asprey: Yeah.

Paul Saladino: Like the suet or the trimmings from a steak? I was slicing this up and giving it to people last night. I think it's amazing. You can even cook it a little bit on the grill, get it soft or on a cast iron skillet, not the grill. You can cook it a little bit on a cast iron skillet and just get it a little soft. That is the go-to. I think it's the fat. It's not the protein necessarily, it's the fat.

Dave Asprey: It's the fat, marrow, too.

Paul Saladino: It's the fat, yeah.

Dave Asprey: You crack open the bone, you get the marrow that's not-

Paul Saladino: Raw marrow.

Dave Asprey: Not overcooked and there's something that happens. Your whole body is just singing. Your cells are like, "Yeah."

Paul Saladino: I'm sure it's ketones. It's fat-soluble nutrients.

Dave Asprey: Yeah.

Paul Saladino: There are nutrients in the muscle meat. One of the things that I talk about in the context of a Carnivore Diet is not having people overeat protein.

Dave Asprey: It's a massive problem. Tell people why. In fact, I just wrote a quasi negative piece. I'm not against the Carnivore Diet. In fact, it just saved a friend's life. It was like, "Hey. If you're eating a lot of muscle meat, your amino acid ratios blah, blah, blah."

Paul Saladino: Yeah.

Dave Asprey: I think there's more to it. Tell everyone listening why high protein on a Carnivore Diet could be a problem and how the heck you avoid that.

Paul Saladino: There are two issues. I know that you've mentioned both of these and I really appreciated you highlighting these. The first is the methionine glycine ratio, which you've talked about on your post.

Dave Asprey: Yes.

Paul Saladino: The idea here is that muscle meat relative to the amount of glycine in muscle meat, the amount of methionine is fairly high. If you actually look at the percentage of methionine and the percentage of glycine, what I've seen is that glycine is about two and methionine is about seven. It's the relative ratios of those because if you look at collagen or collagenous connective tissues of an animal, the amount of methionine is about .9 and the amount of glycine is about 23 or 27. You can see that we don't really know what human biology, what the optimal methionine glycine ratio is but I suspect it's different than two to seven.

You need less methionine and more glycine than two to seven as occurs in muscle meat. There's a whole series of experiments that were done in the 1950s and 1960s on rats that everyone cites saying, "Excess methionine is bad for you." Really, when they did the follow-up experiments, what they found was that it was the absence of glycine or the imbalance of glycine that was the really detrimental thing. When they added glycine back to those rodent experiments, they saw prolongation of life and longevity.

What we know in human biochemistry is that much like a rodent, if we over consume methionine without balancing it with glycine, we may be setting our self up for biochemical stress, biochemical disaster.

Dave Asprey: It's funny because if you look at the history of collagen as a supplement, Bulletproof put collagen on the market as something worthy of consideration. Now, it's become a big category in and of itself. We have a top selling collagen protein bar. It's all grass-fed and all that kind of stuff because of what you just said. That science is real. I'll tell you, if I'm going to eat more than two or four ounces of meat in a meal, because I do practice moderate methionine restriction. The traditional way of doing it would be to have some soup made of bones.

Since bone broth is a pain in the ass to make, I just take a scoop of my collagen and I put it in water and I chug it before I have foods that are high in methionine to keep my ratio where I want it to be.

Paul Saladino: I love it.

Dave Asprey: You're down with that.

Paul Saladino: On Instagram and social media, I made a thing out of putting collagen directly on the steak. Some people are like, "Oh, we love-

Dave Asprey: Our collagen's pretty neutral. It's about any protein powder you'll get, much a lot like pea protein or something gross.

Paul Saladino: Gross.

Dave Asprey: Seriously, you ruin a steak by putting collagen on there?

Paul Saladino: I don't think it's that bad, Dave. You got to try it.

Dave Asprey: Yeah. I can pour unflavored collagen powder or pour it in my hand and they just like their fingers and eat it. They love the taste.

Paul Saladino: Yeah. It's good.

Dave Asprey: Wow.

Paul Saladino: Yeah. The other thing is, for people to think about the fact, this gets to the idea of a nose to tail Carnivore Diet. If you and I are in a tribe, we're out hunting and we kill a deer respectfully. We're thankful for the animal or we kill a bison, we are going to take that animal back to the tribe. We are going to eat every single piece of that animal. We're going to eat the tendon that connects the knee cap. I don't even know if a bison has a knee cap.

Dave Asprey: They do.

Paul Saladino: We're going to eat all the tendons. We're going to eat all the pieces of the animal that we know about as Westernized humans, we only see the muscle meat. We don't see the fat around the kidneys. We don't see all the tendinous tissue that animals have. That's where the collagen is in the animal.

Dave Asprey: Yeah.

Paul Saladino: That's what we're missing as well as Westernized humans, we're just focused on tenderloin steaks and ribeyes, which are delicious. We're not eating the whole animal. If you look at the whole animal, there's all this connective tissue. I encourage people to either do a collagen supplement, a glycine supplement or just eat collagenous tissue from the animal. Get tendon and make tendon or get more tendinous tissue from the animal. That's one of the reasons I like the fat from the animal because it will often have tendinous tissue in it. It offends the delicate sensibilities of some people. We're not used to it as Westerners. It's quite common in other cultures.

Dave Asprey: Yeah.

Paul Saladino: I try to eat tendinous tissue as a source of that glycine thinking, "Okay. I'm just trying to eat the whole animal." The other thing about eating tons of ribeyes, which is certainly one of the flavors of a Carnivore Diet is that you know what

I've seen in myself and others who I work with as a physician is that it pushes your fasting glucose up. It just does. This really worries-

Dave Asprey: Because of the muscle protein.

Paul Saladino: Yeah. Because I think we're exceeding our need for protein.

Dave Asprey: Yeah.

Paul Saladino: As you know, humans don't run on protein. We either run on fat or carbohydrates. We are-

Dave Asprey: Emergency fuel source and it'll trash your biology to be protein-driven. The high protein diets are terrible.

Paul Saladino: I think I agree with you completely.

Dave Asprey: Including high plant protein, by the way.

Paul Saladino: Yeah. Yeah. You don't want to put your body through the stress of that. Now, I think that there is a low end for protein. If we get too little, we're going to get sarcopenia. We're going to get bone density problems. We're going to lose muscle mass. There's a clear sweet spot for humans for protein. My impression of that is something like .7 to 1.1 grams per pound of lean body weight. That's a little more than a lot of people will recommend. Maybe you could go to .6, maybe .6 to 1.

Dave Asprey: .6 is my number, yeah, the minimum.

Paul Saladino: .6 per pound of lean body weight, not kilograms, per pound. I think that that's what you want to find. It's a real easy metric to follow. You can look at your fasting glucose. If people have a CGM or a continuous glucose monitor. You can look at the amplitude of the post cranial glucose excursions, which are on a Carnivore Diet will be very low because the glucose drop a day is very mellow. People can look at the fasting glucose. They can look at their A1C and if they're eating too much protein, you'll see those bump up a little bit. They edge into the 90s. The fasting glucose goes into the 90s. The A1C goes above 5.4.

I don't like that. If you look at the studies that have been done, it's very clear. When we look at fasting glucose and A1C and mortality, large studies in Korea, the sweet spot is right around 75 for fasting glucose. If we're doing things that elevate our fasting glucose above that, I have real concerns about that.

Dave Asprey: I just finished the manuscript for Superhuman, my how I'm going to live to at least 180 and you can, too kind of book. I talk quite a bit about those issues both with methionine but also with this idea of how much protein do you need? One thing that comes out of the data that surprised me is that low insulin is a much,

much stronger predictor of all cause mortality than high insulin. When you go on a high fat keto unending non-cyclical diet or presumably and this is part of my question. A Carnivore Diet, aren't you creating a low chronic insulin state?

Paul Saladino: The insulin is usually pretty low.

Dave Asprey: Have you looked at the studies on low insulin and all the bad things it does when it's too low?

Paul Saladino: I think what's interesting is that when we're looking at insulin, it's just this one time point. We'll get one fasting insulin. One of the things that I wish we could develop, maybe you and I can develop this, is a continuous insulin monitor. I think that what-

Dave Asprey: It's coming.

Paul Saladino: Yeah.

Dave Asprey: Insulin, glucose, ketones and probably organic acids for all we know but good stuff will come. It has to.

Paul Saladino: Yeah.

Dave Asprey: If your aura ring can do what it can do now in just a ring, not a chest trap from 10 years ago, I'm pretty sure we're going to get there on the little stick on monitors.

Paul Saladino: What you'll see is that when people eat, even if they're eating fat and meat, you're going to get insulin rise. It has to rise. You're going to get glucagon rise with it. The ratio won't change a whole lot. People on Carnivore Diets are not going to have insulin that's chronically super low. You're going to get rising insulin. We know that because if you didn't have any insulin ever on a Carnivore Diet, you wouldn't have any anabolic stimulus. You would lose your muscles. You would lose your bone density. I think that humans want to activate emptor every once in a while. We need some anabolic signals.

We need to activate emptor but we want to balance that with kinase and turning these things off. When we are eating meat, when we are eating throughout the day preferably in a time or shift eating window, we can talk about that. We're going to get insulin rising. It's not chronically low insulin. It's just a fasting insulin is very low on a Carnivore Diet. Now I think that the super low insulin all the time is a very different thing. That's why I think postprandial insulin might be the marker to look at. I think I might start measuring that in some of my patients. My friend here in Seattle just got a microplate rear.

I hang out with some pretty amazing people here. We got a kit, a 400 lysis. We're going to do insulin. We're going to do all these measures on ourselves and create a continuous insulin monitor throughout the day.

Dave Asprey: Wow. All right. That's fascinating. Now let's get back into this anti-plant thing. Whether you're for or against vaccines or different female reproductive things and all that sort of stuff. It's actually not as black and white as for plants or against plants or for meat as against meat. It's way more nuanced but I'm just saying that to be inflammatory. Your anti-vegetable stance poll, as a clearly bad human being, what are the major classes of plant-based compounds you're most concerned about? I have my Bulletproof Diet 5 but I'm going to ask you. I'm going to quiz you on yours. We're going to correlate it to those. You're going to tease me about the ones I missed. Give me your deep list.

Paul Saladino: Yeah. Yeah. It depends how granular you get with the plant defense chemicals. I would classify the first large category as phytoalexins. Phytoalexins is quite a broad category. That just means plant defense chemicals. These are chemicals that plant make in response to injury, that plants make to discourage insects herbivores, omnivores from eating them. Within the category of phytoalexins, there are many different types of plant toxins, which we can go into. As a broad category, there are plant phytoalexins. There are also oxalates and lectins. It depends how we classify all this.

I don't know that oxalates are necessarily a phytoalexin because plants often use oxalates to move ions and minerals around the plant. Lectins are probably part of plant's normal germination process but can really muck up human biology as well. I think of it in terms of those big three. Perhaps phytic acid would be a fourth one but you might include phytic acid in one of those categories as well. Those would be my four. In the category of phytoalexins, we can break that down even further. I suspect a lot of years, it might fall into the category of phytoalexins if we're thinking about some of the other molecules in there.

Dave Asprey: Sure. Lectins, we largely agree on. Dr. Gundry's been on the show and I wrote a chapter in the Bulletproof Diet on lectins. However, I think you probably learned it in medical school. We make a thousand lectins in our own bodies every day, a thousand-

Paul Saladino: Absolutely.

Dave Asprey: It's a broad class of compounds.

Paul Saladino: Yeah.

Dave Asprey: To say all lectins are bad would be to say that you must die.

Paul Saladino: Yeah.

Dave Asprey: Also, there are lectins in the meat you eat. They're just not that-

Paul Saladino: Yes, there are.

Dave Asprey: Right.

Paul Saladino: Exactly. Because they're more compatible with your biology. One of the things that I have developed as a meme, as a teaching point for people is this idea that plants are from a different operating system than humans.

Dave Asprey: Yeah. Yeah.

Paul Saladino: Many of the molecules that plant use don't play well with our biology. It's like-

Dave Asprey: Most of them don't.

Paul Saladino: Exactly. Most of them don't. Oxalates and lectins are a great example. You're absolutely right. We have carbohydrate binding proteins in humans. Meat has carbohydrate binding proteins. The chances of a carbohydrate binding protein for my plant interfering with your biology are much, much greater than a compatible molecule from a cow or a deer interfering with your biology. It basically is you. It's built just like you. It's biochemistry is 99.99% the same. You're right. Lectin compatibility is really the issue. Dr. Gundry's done a great job of highlighting that.

Dave Asprey: Lectins are out there. I don't think all plant lectins are necessarily bad for you. It depends on who you are. There are people who tolerate night shades. I think night shades are generally bad for everyone. Some people handle them better. Some people handle them much more poorly than other people. Lectins are there. The oxalic acid thing, man, when I went on Joe Rogan the first time, I was like, "Hey. Here's Bulletproof coffee." Joe's like, "Yes. Oh, my God. I can't believe how I feel." The second time, I'm like, "You know, I want to give something back to this community. I'm going to do the deep research on kale."

I've read this post because at the time, that was the big thing was kale smoothies. I tried kale smoothies. I've been that raw vegan eating a bucket of kale every day and all that. It causes inflammation at least for me. I went through, "Okay. Here's how you cook kale. Here's how you bind the oxalic acid. Here's how you pour the water off. Here's the species of kale with lower oxalic acid but with the lacy kale is bad and the Dino kale is good.

Paul Saladino: Yeah.

Dave Asprey: Good being less bad and all that stuff. I read this big post and went on and it still pissed people off. I'm like, "Come on, guys. I'm trying to help you. If you're going to do it, do it this way or maybe just skip it already." That's my oxalic acid story.

The category of toxins from plants that you didn't mention that I think is noteworthy is field toxins and storage toxins.

Paul Saladino: Mycotoxins, absolutely.

Dave Asprey: Hold on. Did you just say mycotoxins a real thing?

Paul Saladino: Mycotoxins are very real thing, my friend.

Dave Asprey: Oh, my goodness. Didn't you hear Rhonda Patrick when she went on Joe Rogan right after one of his friends decided to knock off Bulletproof and he decided that I was a bad man? He had Rhonda Patrick come and say, mycotoxins didn't matter in human biology. Are you disagreeing with the great Rhonda Patrick who is too busy to come on Bulletproof Radio?

Paul Saladino: I think I would disagree with Rhonda Patrick about many things.

Dave Asprey: No.

Paul Saladino: Yes.

Dave Asprey: Oh, my goodness.

Paul Saladino: Let me say this literature about mold toxins.

Dave Asprey: You mean the thousand studies I have on the Bulletproof website?

Paul Saladino: You already know that. Yeah. You should make a movie on it. Wait, you did. Yeah. No, no. Mycotoxins are a big thing. I recently had Anthony Jay on my podcast, which is Fundamental Health.

Dave Asprey: Yeah, yeah. How many episodes do you have by the way on Fundamental Health?

Paul Saladino: I have nine or 10 now.

Dave Asprey: You just got started. I haven't checked it out. I'll check it out.

Paul Saladino: Yeah. Just check it out.

Dave Asprey: Fundamental Health is the name? Okay.

Paul Saladino: Fundamental Health with Paul Saladino, MD. Yeah. I had Anthony Jay on. He is a PhD who works at the Mayo Clinic in Rochester. He's written a great book on estrogens. We were talking about myco-estrogens.

Dave Asprey: Yes.

Paul Saladino: Great.

Dave Asprey: Zearalanol, right?

Paul Saladino: Yeah.

Dave Asprey: Okay. Tell people about zearalanol. Do you know what it is?

Paul Saladino: I think you and Anthony may know more than I about that.

Dave Asprey: Okay.

Paul Saladino: I know that when grains get moldy, they get these I don't know if Z is Zanthan or something.

Dave Asprey: No. That's [inaudible 00:51:49]. That's good for you, at least if you believe as I do that some of those things are good for your eyes even though they come from plants. You're talking about zearalanone, the mycotoxins that's-

Paul Saladino: Yes. Zearalanone, yes.

Dave Asprey: It's a thousand times more estrogenic than your own estrogen but Zearalanol and this is why I thought you know about Zearalanol. Zearalanol is purified zearalanone that's sold to ranchers. You put a little wax pellet of Zearalanol into a cow's ear and the feed efficiency of the cow goes up by 30%. Now, that means the cow gets fat on 30% less calories. If you're one of those old school 1970s calories in, calories out guys, you tell me how that's possible. It's not about calories in, calories out. It's about hormone manipulation in that case.

If you're on a Carnivore Diet and you're not eating grass-fed meat, you're getting a dose of synthetic estrogens purified from mycotoxins. What they do is they cause fatty streaking in the muscles. You know that nice marbled cut? I don't want marbled tissue in my body, thank you very much. I don't eat marbled tissue. That's why for the people who are into the Carnivore Diet or just in the Bulletproof Diet, grass-fed or be vegetarian. In your case, I don't know what you do if you're not grass-fed.

Paul Saladino: I'm wild.

Dave Asprey: Okay. You're down with the mycotoxins having some effect on human biology.

Paul Saladino: Yeah, yeah, yeah.

Dave Asprey: Okay.

Paul Saladino: This is the other thing I was talking about on that podcast with Anthony about. The fact that when cows are fed multi-grains or they're fed corn, that corn is

also sprayed with Atrazine, which has an estrogenic effect. I do have a lot of concerns with those estrogenic molecules accumulate in the fat and in the muscle of these non grass-fed animals. I've often thought if you look at a healthy human, if you look at a human athlete, you're not going to have intramuscular fat deposits. I love that you brought this up, Dave. Yet you go to the butcher and you're like, "I want that marbled meat." That is a cow with metabolic syndrome.

Dave Asprey: Yeah.

Paul Saladino: You're eating-

Dave Asprey: It's a diabetic cow.

Paul Saladino: That is a diabetic cow. That is a cow with inflammation. The way that healthy muscle is supposed to look, you're not supposed to have fat in your muscle. It tastes better because of the fat. You know what? You're supposed to have fat stores around the muscle or fat on the tendon streaks or fat in the rib eye in that place but intramuscular fat, that's suggesting a sick cow. Whether they're giving them the myco-estrogens in the ear like you're suggesting or whether they are giving Atrazine on the corn, this is going to bio accumulate in your meat. It's a big problem, these estrogens and these mycotoxins. Yeah, absolutely.

Dave Asprey: That's another-

Paul Saladino: You can eliminate all the mycotoxins if you don't have any plants.

Dave Asprey: Well, except no.

Paul Saladino: On the food.

Dave Asprey: That's the problem. A lot of us know the amazing myth and I mean myth in a bad way but just the mythology of 48-day dry aged beef.

Paul Saladino: Yes. That's not a good idea.

Dave Asprey: It took me a while to figure this out. I'm dieting. "Why do I feel inflamed? Why is my brain foggy after I ate that amazing \$80 steak?" What happens when you hang meat for a while in the right environment is you're fermenting it and you're allowing fungus to grow. They cut off all the black stuff from the outside of it but the hyphae, the fungal roots have gone into the meat. They've tenderized it. News flash. You're eating meat contaminated with a fungus that feeds on meat. You are made of meat. That seems like a bad idea to me.

Paul Saladino: I agree with you.

Dave Asprey: Okay.

Paul Saladino: Yeah. Yeah. I've always thought about dry aged meat. It's so funny that as Westernized humans, we're just in search of the most unhealthy meat we can get. We're in search of marbled grain-fed-

Dave Asprey: Charred.

Paul Saladino: Fatty meat that's been dry-aged and then overcooked and burned in a steakhouse. No wonder people think meat isn't good for them because you're not eating fresh meat that you just killed with your tribe. That's not how it's supposed to taste. That's not the meat you want.

Dave Asprey: It's funny, too. It doesn't taste right. If I was to go and it's been many years since I did this. I used to go out and eat a piece of non-grass-fed steak. I used to just eat those stuff with no fat. If you can't get organic or grass-fed, eat the filet because there's almost no fat in it. You'll avoid the fat-soluble toxins. I still feel crappy. I think the reason at least in the US is, this isn't a plant-based issue. Although plant-based diets cause this issue. It's glyphosate.

Paul Saladino: Yeah.

Dave Asprey: Stephanie Seneff came on the show a while back and talked about this in detail. The gly in glyphosate is glycine, that amino acid you just talked about. Do animals including us, will we substitute a glyphosate molecule for a glycine molecule? Yeah. If you get your collagen and there's people selling it as a health product. They're selling collagen from chickens. Not organic chickens and it's going to be full of glyphosate residues if you test it. See what you find. This is the other one of the toxins that's out there both in meat that could be in your carnivore or your paleo or your Bulletproof Diet if you don't pick the right animal.

I guess that's not on your list of five or my list of five because it's not plant-based. It's just caused by this assumption that plant-based agriculture is okay the way they do it.

Paul Saladino: It's so bad. It's water-soluble toxin. It's in everything now. We can't avoid it. Yeah. Even you and I unfortunately, we're really trying to filter our water and eat good meat. For those who are eating plants, even eating organic plants, you're going to have glyphosate residues in your body. I think this is an incredible disservice done to the human race by Monsanto Bayer.

Dave Asprey: Well, they're getting the pants sewed off them right now and losing in court.

Paul Saladino: Good.

Dave Asprey: The whole value of Bayer is dropping because they bought Monsanto. I believe in business karma.

Paul Saladino: Amen, brother. Amen.

Dave Asprey: Let's see what happens there. Okay. The other plant-based or at least plant compounds that are particularly of concern to me but also in animals, it's toxic metals. There's something called thallium that a lot of people don't know about. Are you read up on thallium? Talk about why I'm concerned about it in plants or do you have a story about it?

Paul Saladino: I don't have a specific story. Let's hear what you know about it. I just know that it's a heavy metal that we don't want to accumulate. I remember hearing something about kale accumulating.

Dave Asprey: Yeah.

Paul Saladino: Maybe it was thallium, yeah.

Dave Asprey: Here's why thallium's an issue. Thallium's known as the poisoner's poison because in Russia, they would use it. It was commonly used because it disrupts potassium in the body. It's flavorless and colorless. You put it in there and it inhibits mitochondrial function, causes all sorts of havoc. You just don't know why the person starts to die. It's not that common. Problem is in the US, we banned lead from gasoline because lead is another really serious thing that you get in animals or plants raised near freeways and things like that. We took lead out of our gasoline.

Guess what they replaced the lead with? Thallium. Guess what plant in the entire plant kingdom will attract and concentrate thallium more than any other? It's kale.

Paul Saladino: Kale.

Dave Asprey: All the cruciferous vegetables do that. You better be eating some organic stuff but even organic kale when they test it is exceptionally high in thallium. If you're one of those people with the best possible intention is eating two kale salads a day and you have higher than normal levels of thallium, which means lower levels of mitochondrial function and kidney stones and sore joints all the time. Maybe you should get some lettuce instead of kale. You just might like your life better.

Paul Saladino: You can just eat animals nose to tail.

Dave Asprey: All right. Have you ever had a pig nose?

Paul Saladino: No.

Dave Asprey: All right.

Paul Saladino: I'd try.

Dave Asprey: We butchered our two pigs last year. If you go to my Instagram page, dave.asprey, there's a picture of the face. We took half the skull and I cooked it. I souvied it and then finished it in the oven. It was actually the best pork I've ever had. Crispy skin, amazing but that little last inch of snout, man, I can't get anyone at the table to really want to eat the nostrils. It was not nice. The next one's going into head cheese, which is going to be okay.

Paul Saladino: It's high in collagen though. I'm sure it's good for you.

Dave Asprey: The snout? It's certainly high in collagen. It was also highly marbled. It's pretty weird but there's just something on the texture that was just not right. I don't know. Also, you have to really be comfortable with the fact. This pig had a good life. I've fed that pig and now it's feeding me. It's a synergy there. For people who are saying there's animal cruelty involved, they have never seen what happens when you disrupt hundreds of acres or in this case, hundreds of square miles of prairie, just death and destruction of animals from mono culture. You have tractors going through to make these low density not very healthy foods that then get tracked around.

The death per calorie on a Carnivore Diet from grass-fed is way, way less than on any vegan diet you can do, unless you're growing the vegetables yourself in your garden. I do actually have about a half-acre of garden behind me where I grow all my own vegetables. I can tell you not a lot dies in that garden. Most of the time, by the time your food's transported, everybody lost. I get off mine right there.

Paul Saladino: I agree with you completely. The by kills with plant agriculture is a big deal. We don't have to go down the environmental thing. We could probably do a whole another podcast on the environmental stuff.

Dave Asprey: Yeah, we could.

Paul Saladino: I did a podcast on my podcast with Peter Ballerstedt who is very interested in the environmental stuff. It'll be out in a couple of weeks. Probably by the time this comes out, it'll be out. Peter has gone to great lengths to share this message. He's educated me a lot about the fact that the greenhouse gas emissions from cows are not the same as new emissions from fracking or technology or other types of carbons. I would encourage people, if they worry about greenhouse gas emissions from cows to seek the fact and don't watch the vegan propaganda because they're very low.

Dave Asprey: Yes.

Paul Saladino: They're very low. They're minuscule compared to the new carbon that is being created by technology, by burning fossil fuels, etc. We all contribute to this. I'm guilty as well. I drive a car. I wish I had an electric car. I don't yet but fossil fuels are everywhere. The fact that people vilify ruminant animals, which are actually if they are grass-fed and properly raised contributing to an increased amount of carbon-carrying capacity of the soil and decreasing overall greenhouse gases. The fact that people vilify those animals is just an injustice.

Dave Asprey: Yeah.

Paul Saladino: That's one of the ways we could really, really change the amount of greenhouse gas in the world, more ruminant animals.

Dave Asprey: It's anti-nature. It's anti-human. It's anti-animal. Those animals exist in our ecosystem for a reason. They exist for my farm for a reason. Part of it is soil integrity. Pigs prepare the soil. The sheep shit on the soil, which inoculates it with the bacteria that it needs and then amazing stuff happens. If you don't have that cycle, it doesn't work. This is also one of the reasons, too. Some of the proceeds from Superhuman, my anti-aging book are funding a carbon capture enterprise. I donate to them.

Paul Saladino: Cool.

Dave Asprey: Because we've got to solve the problem. The single biggest thing we have to do is fix our soil. You got to have grass-fed animals to do that. That will capture carbon and also-

Paul Saladino: Yeah.

Dave Asprey: Soil to grow those dumb vegan burger things. We're going to run out in about 60 years if we don't do this. It seems important to me. Yeah. We could do a whole episode on this.

Paul Saladino: Did you see the literature about how much glyphosate was on I think it was the Beyond Burger? It was so high.

Dave Asprey: Those are ultra-processed foods.

Paul Saladino: It was so high.

Dave Asprey: I'm sorry.

Paul Saladino: Yeah.

Dave Asprey: I like the idea of that but just because it tastes like a burger, I could probably make cyanide taste like a burger. It doesn't mean you should eat it. It actually

has to functionally act like a burger in your gut and then in yourselves for it to count.

Paul Saladino: Yeah.

Dave Asprey: I want that to work but it seems like a sad excuse to sell non-organic big food to me. All right. Let's switch back to one of the big criticisms of meat. I've debunked this although I don't really like the word debunking because that implies the person was trying to bunk. We'll say I have corrected the mistake is a more accurate way of saying it around TMAO. What is TMAO? What's the issue here?

Paul Saladino: TMAO is Trimethylamine oxide. Dave, I just recorded a podcast yesterday with Tommy Wood and we went into this in detail. It is such an interesting story. There was a study that it was either published or I saw it on Twitter yesterday. I'll tell people the story of TMAO and then I'll tell people why it is nothing to worry about. TMAO is produced in the liver when TMA is converted to TMAO by an enzyme called FMO3. Now, another way that you can get TMAO is when you eat compounds with either pre-formed TMAO, which include fish.

Dave Asprey: A lot of it.

Paul Saladino: Which has 40 times more TMAO than the amount of TMAO that you will get from eating meat, which has choline and carnitine. This to me is such myopia on the part of researchers and anyone vilifying TMAO.

Dave Asprey: They say it causes cancer basically.

Paul Saladino: They say it causes cancer. The research with TMAO is not mechanistic. The research with TMAO is not mechanistic. It's epidemiologic. People need to know that many of the things that we have that are told to us about the negative qualities of meat are observational epidemiology. They're not actually experimental.

Dave Asprey: They don't know why. It's crappy science.

Paul Saladino: It's horrible science.

Dave Asprey: We just mentioned eight different things you can do wrong when you're eating your meat. They're like, "Oh, I don't know. These people eat sausage made from crap animals and then bad things happen. Therefore, all meat is bad." That's stupid.

Paul Saladino: It's just stupid. What we have seen, what researchers have seen and where the whole sorted fairytale, where the whole unfortunate misconception about TMAO comes from is that people who have higher levels of TMAO on their blood are sometimes associated with worse outcomes. Yes, mortality or

cardiovascular or diabetic outcomes. Then they extrapolate and they say, "Don't eat choline. Don't eat carnitine. Don't eat meat," which is crazy. Because those things are super valuable for humans in so many ways.

Dave Asprey: Choline, you must have for your nervous system to work.

Paul Saladino: For your liver to make phosphatidylcholine, a great way to give yourself non-alcoholic fatty liver disease is to become choline inefficient. Now, the incredible logical flaw here and I can't believe people make it so often is they say, "It's associated. Therefore, it's causing it." The study they came out yesterday clearly show and I can find you the reference or we can put it in the show notes for people. It showed that it's probably a reverse causality. What I hinted to at the beginning about the fact that the enzyme that makes TMAO in the liver is controlled by insulin.

What we are seeing here is a fact of the fact that people who are insulin-resistant may have more TMAO. That when there's more insulin, there's more activity of FMO3. Those people make more TMAO and it's not the TMAO that's causing harm. It's the insulin resistance. This is the pattern we see over and over and over is that things get called problematic when in fact, it's the underlying insulin resistance that we know is the problem.

Dave Asprey: In fact-

Paul Saladino: That's the case with TMAO. It's reverse causality. In the study they did there, they were able to show that people with diabetes, coronary vascular disease have higher levels of TMAO and the whole association was reverse causality. Meaning, TMAO is higher because they have diabetes and cardiovascular disease. It's not causing the problem. Are you listening, Stephen Gundry?

Dave Asprey: I love Stevie. He's a great guy.

Paul Saladino: He's a great guy.

Dave Asprey: Talk about an accomplished physician and changes the world in multi-levels at once. Yeah. There's some things that I don't agree with Stephen on. Directionally, I think he's got some good stuff. All right. Here's what's really mind-blowing. Go back to the cool fact of the day about, "Oh, gee. Your gut bacteria changed every drug study." We can identify which gut bacteria make TMAO. In fact, they make more TMAO than your liver enzymes do.

Paul Saladino: Right.

Dave Asprey: Using my Viome test and disclosure, I'm an investor and early adviser and just a big fan of Viome. [Viome.com/dave](https://viome.com/dave) I think will get you some special I don't even know what it is. The Viome test showed me, "Oh, I don't have TMAO-forming bacteria in my gut." You know why I would hypothesize I don't? Because I don't

eat antibiotic-fed animals. If you eat animals full of antibiotics, they change your gut bacteria. You're probably more likely to have more TMAO formers. Guess what else Viome just announced last week? A study they published in a procedure's journal whose name I forgot.

The study said with 90% accuracy, they can predict your glycemic response to 27,000 different foods only by knowing what bacteria is in your poop and what it's doing. The connection between, "Oh, I'm at high risk for having diabetes," which is in part a function of your gut bacteria. Whether TMAO does anything in the body or not is also a function of gut bacteria. You're thinking, "Oh, maybe this goes back to something else." Whether a TMAO itself causes anything, no one has a mechanism for it. Therefore, it's not good science.

Paul Saladino: It's horrible science. I think it's been clearly shown now its reverse causality. It's the insulin resistance. If people want to be healthy, don't become insulin resistant.

Dave Asprey: There you go. Reverse it if you are. We've got to talk a little bit more about the microbiome.

Paul Saladino: Let's do it.

Dave Asprey: I monitor mine. I went from 48 species up to 196 species by actually adding the stuff that feeds butyric forming bacteria. I have a prebiotic formula that's based on two years of that sort of stuff called Inner Fuel. It's coming out. It is made from very specific plant compounds where you remove all the bad stuff. I would say these study's saying whole grains are good for you or whatever. They have fiber. Look, if I was to take fiber and I was to cover it in lead and some ricin nerve gas, which is also a plant-based protein for-

Paul Saladino: It's a lectin. Ricin is a lectin.

Dave Asprey: Exactly, yeah. Ricin is a plant-based protein just like it's pea protein. Actually, it's bean protein.

Paul Saladino: Castor beans.

Dave Asprey: Yeah, exactly. Anyway, we put those in with fiber. You go, "There's fiber. It's good for you." That's my picture for this whole beans and whole grains. They're so good for you. The studies around fiber, there's a lot of evidence that shows having the right fiber, feeding the right bacteria can have benefits. Rather than asking you to refute all those studies, which I think might be a long discussion and difficult, what I want to ask you about is where do you get fiber in an animal-based diet?

Paul Saladino: I think you know the answer to this question. You actually can get fiber from collagen, from the connective tissue of an animal. The whole butyrate question

is very fascinating because people worry that on a Carnivore Diet, you're not going to make short chain fatty acids. That's just not true for a variety of reasons. As Dave is hinting at, the collagen in an animal could actually be fermented into short chain fatty acids but also, what has been shown in feeding experiments is that protein can also make short chain fatty acids. They're different than butyrate. It's isobutyrate or acetate or propionate but there's plenty of short chain fatty acids.

The fact that on a ketogenic diet, like carnivore, like nose to tail carnivore, you're going to have circulating beta hydroxy butyrate. Means that the epithelial cells in the gut are going to have plenty of fuel but yeah. There is a "sneaky animal fiber" on a Carnivore Diet.

Dave Asprey: That's what I wanted you to say was the words animal fiber. I was hoping you'd go there. That is a nickname for collagen. In the Bulletproof Diet, I think I'm the guy who put this stuff in the map because no one I knew had heard of it. I remember at A4M talking with Dale Bredesen, The End of Alzheimer's author that's been on the show and David Perlmutter and saying, "I have this study. It says that you can turn collagen into butyric acid. There's just one little problem. The only study I could find was in leopards." Have you seen anything since the leopards study?

I know it's possible but we have no evidence that the human gut has ever turned collagen into butyric acid. I just think it does because you can survive on just meat the way you are. You actually do well and you make butyric acid. Therefore, something's happening. It's probably collagen. Do you have a better study?

Paul Saladino: I just know the leopards study.

Dave Asprey: Darn it.

Paul Saladino: We'll look for it.

Dave Asprey: Okay.

Paul Saladino: We'll do the experiment. Maybe my buddy with the microarray will find some way to actually-

Dave Asprey: If you could prove that collagen makes butyric acid in the gut, it would solve a lot of mysteries. I would bet that that's the case. It almost has to be. All right. There's your answer for the microbiome. What I haven't seen and in fact, I bet you that Naveen from Viome would probably be more than happy to run a small test of 10 people or something who are going to be on high collagen animal-based diets just to see what their gut bacteria did overtime. I don't know if he does that kind of stuff but I could just ask him.

Paul Saladino: We should do it.

Dave Asprey: All right. Okay, if you're interested.

Paul Saladino: Yeah, please. Yeah.

Dave Asprey: Okay. All right. I've got one more question for you. I've publicly stated, "Hey. I'm going to live to at least 180." I think we can do it. Now, you've got medical training. You've done all sorts of cool stuff. You're deep in the biochemistry like I am. How long do you think you can live?

Paul Saladino: I'd say probably something similar. It lengthens your telomeres. Red meat. There's actually studies that shows-

Dave Asprey: Really?

Paul Saladino: If people go online and Google that right now, red meat telomere lengthening, they'll find it in an instant.

Dave Asprey: Got it.

Paul Saladino: Yeah. It's not a fringe study.

Dave Asprey: Wow. Who would have thought? Okay. I got to ask then ferritin levels. If you're listening to this and you don't know what ferritin is, that's okay. You're just a normal person like most of us. Ferritin is the amount of iron in inflammatory compound from too much iron. Eating a lot of red meat can raise ferritin. What's your take on ferritin on the Carnivore Diet?

Paul Saladino: I think that it's very individual. I think that what we see with ferritin is complicated because it's an acute phase reactant. When I'm looking at ferritin, I have a number of clients who are carnivores and keto now. I've seen a lot of ferritins. I've checked mine multiple times. It was 87 and I talked to Joe Mercola. He was very concerned. He said, "What's your GGT?" My GGT is 13 so I always correlate a ferritin with a GGT. I don't want to see oxidative stress. When people have a ferritin above 100, I'll use other inflammatory and oxidative stress markers to triangulate and say, "Do I really think this is causing oxidative stress in people?"

Certainly, there are people with polymorphisms like hemochromatosis who will over accumulate ferritin to very dangerous levels. Those people will need to get phlebotomy no matter what they eat. Whether they're eating lots of red meat or not. For the general public, I'm not really concerned about over accumulating iron. I think the body is pretty good at doing this. If I saw someone and they had an elevated ferritin, I would want to know why and I want to triangulate with other markers of oxidative stress like you're suggesting. Try and answer the

question, is there oxidative stress? I would want to do the markers that I suggested earlier.

F2 isoprostane, 8-hydroxy, 2-deoxyguanosine, get a sense of where that's going. As we suggested earlier, maybe the ideal animal-based diet is not excessive amounts of red meat. Maybe it's just that Goldilocks amount of really good red meat with organ meats and good fat and that nose to tail thing, well cooked in a way that doesn't have polycyclic aromatic hydrocarbons.

Dave Asprey: We have this interesting perspective. You've got guys like Dr. Gundry who basically say, "You know, probably a lectin-free, vegan, keto cyclical diet is really the business." What I'm hearing from you is basically a low protein mostly ketogenic Carnivore Diet is the way to go.

Paul Saladino: I would say moderate protein, not low protein.

Dave Asprey: Yeah, moderate protein, fine. What you heard me saying is a low to moderate protein, non-lectin cyclical ketogenic diet is the way to go. You have to pick the vegetables based on your own biology including your gut bacteria and just including what works and what doesn't work. How would someone listening to the show possibly sort out these opinions from two people with medical credentials and one unlicensed biohacker?

Paul Saladino: I think that they have to see what works for them. I would say, man. Anyone listening to this show, if you do any one of those three things, you are going to feel great. You cannot-

Dave Asprey: You taught 2% of health anywhere and the rest of it's-

Paul Saladino: You cannot go-

Dave Asprey: Okay.

Paul Saladino: You cannot go wrong. You cannot go wrong. I think like I said, maybe this brings it full circle. I think that a lot of people who would go on the Carnivore Diet are either very curious about how they're going to feel doing this or they're very sick. I think that one of the tools that I suggested or one of the rubrics I suggested in the beginning was this idea of elimination diet. I think that people don't need to start with carnivore. If they're super curious, some sort of an elimination diet. You could do well-constructed Bulletproof Diet. You could do-

Dave Asprey: The first two weeks is elimination but if someone Googles elimination diet though, I just want to be really clear. The traditional and the things you read about elimination diet is they take one to two years. They have this incredibly complex. You can only eat something from this family once every four days. It's the most horrible thing. Even I couldn't do that. Eliminate everything that's probably ever been shown to cause a problem. Just eliminate all of them for

two weeks. There's your elimination diet. You know an easy way to do that? Just eat meat.

It's probably the most extreme elimination diet either because unless meat's the problem, you've eliminated everything that's a problem. If your life changes, aha, maybe I could eat meat plus and then you could try something else. You can add things back in until you hit the wall.

Paul Saladino: Just eat animals though. Just eat animals. Not just meat, just eat animals.

Dave Asprey: Yup. Just put the whole thing in a blender. Make a smoothie. It works.

Paul Saladino: Get some liver. You need those nutrients. You need the collagen. We talked about it so much, Dave.

Dave Asprey: I want to keep going. I got one more question for you. Is there a kind of animal you just wouldn't eat?

Paul Saladino: I think that ruminant animals seem to provide incredible nutrition for humans. I can't think of any animal that I would not eat honestly. I will note that it seems to be that ruminants provide really rich nutrition. I eat probably 99% ruminant at this point.

Dave Asprey: Ruminants are good.

Paul Saladino: I probably would not eat some fish. At this point on the earth, I would not eat many fish because they are so toxic with metals. Theoretically in the history of the earth, no. I can't think of any animal that I wouldn't eat honestly.

Dave Asprey: I have a hard time with that. I wouldn't eat elephants because it's mean and baby seal soup or something like that. There aren't enough of them so let's not do that.

Paul Saladino: You would eat with me if we were alive a million years ago.

Dave Asprey: Heck, yeah. I'd smack that guy right on the head with my club and then I would get killed. Yeah. A long time ago, when they were plenty, sure. The other thing is, as I think about it, pythons. I've eaten python once and it's such a horrible experience. They're an invasive species. When I did the research after choking down this horrible thing, imagine the worst squid you've ever had. 10,000 times rubber and tastes a little bit more like chicken and no matter what you do to it, it's just hard to eat. After you eat it, you realize that those things accumulate every metal and every pesticide better than almost anything.

They're just toxic. If you're really tempted to, go smoke a python in your Weber grill. Maybe there's a better choice.

Paul Saladino: Yeah.

Dave Asprey: On that weird note, your website is paulsaladinomd.com. Your brand new podcast, Fundamental Health. I had a lot of fun chatting. You know what you're talking about. I still think you should go eat some broccoli already.

Paul Saladino: You know what, Dave? I'm going to save the broccoli for you. I want to have some meat and fat and liver when we get off this call.

Dave Asprey: Well, I will also eat some pork belly from a pig I raised myself and I will not feel too guilty about it.

Paul Saladino: I think that sounds amazing. I'm coming over for dinner.

Dave Asprey: You're welcome anytime here on Vancouver Island. I do think at this point, I can say I have some of the best meat on the planet, at least if it's lamb or pork.

Paul Saladino: I'm going to be there, brother. I'm coming.

Dave Asprey: Have a beautiful day and enjoy sunny San Diego.

Paul Saladino: Thank you, sir.