



**Transcript of “Gerard Mullin: Gut Balance Revolution, Ketosis, & Artificial Sweeteners - #253”**

Bulletproof Radio podcast #253



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Dave: Hey there! It's Dave Asprey. Before we get started with today's show I want to talk about Casper mattresses. I've upgraded to a Casper it's amazing. The startup guys at Casper are winning design awards, getting props for reinventing the humble mattress and turning the industry upside down. It started with a simple mission, create a perfectly engineered mattress that you can try in the comfort of your own home. Casper ships the mattress to you for free and gives you 100 nights to try it risk free. They'll come pick it up if you don't love it and refund everything no questions asked.

It beats testing a mattress, lying awake on it for 2 minutes in a store. Here's what else I like about Casper mattresses. All the foams used in a Casper have environmental certifications that ensure that they're healthy to be around. Their materials are Certipure certified meaning they're made without ozone depleters or PBDE flame retardants and they're made without mercury, lead or other heavy metals. There's no formaldehyde, no phthalates and they're regulated by the Consumer Product Safety Commission low VOC, volatile organic compound emissions for indoor air quality. They're actually less than 0.5 parts per million.

Take them up on their 100 night risk free trial like I did. Upgrade to a Casper with free shipping at [casper.com](https://casper.com). Use my personal referral code [bulletproof](https://bulletproof.com) to get \$50 off your mattress. That's code [bulletproof](https://bulletproof.com) for \$50 off your next mattress at [casper.com](https://casper.com). Terms and conditions apply. If you haven't already signed out for it check out the [bulletproof conference](https://bulletproofconference.com), [bulletproofconference.com](https://bulletproofconference.com) you'll be able to see Casper beds and a whole bunch of other really cool biohacking stuff. When you come, there's dozens of companies showing the latest biohacking tech stuff you can play with and stuff you can experience.

You're going to hear some lectures about brains, about guts, about your microbiome and about how you can take control of your biology so that you can basically do whatever you want to do more easily. We're finally to the cool fact of the day. Looks like a few hundreds years ago a Turkish

law made it legal for a woman to divorce her husband if he did not bring home a daily quote of coffee. To be fair it said that one point in Turkish culture men would judge a woman's ability to make a good wife based on her ability to brew coffee so it seems like there's some equality here. Got to say coffee law. I like these laws.

Today's guest isn't about coffee but he's an associate professor of medicine at the Johns Hopkins Hospital, a board certified internist and he's very well-known and internationally renowned for his work in integrative gastroenterology and nutrition. A founding member of the American board of Integrative Medicine and he's been selected as one of America's top physicians since 2004. He just came out with the Gut Balance Revolution and he runs the foodmd.com. I'm talking about if you haven't already of him Dr. Gerard Mullin. Dr. Mullin also lost 100 pounds on his microbiome diet and this is why I wanted him to have to talk on the show to talk about gut biome. Gerard, welcome to the show.

Gerard: Thank you very much my pleasure.

Dave: By the way I didn't ask you ahead of time, would you like to be called Dr. Mullin because you're wearing the lab coat set up there or should I try call you Gerard? What do you like on the radio?

Gerard: People call me Dr. Gerry.

Dave: Dr. Gerry there we go. You know I ask you ahead of time but I didn't so my bad.

Gerard: That's okay.

Dave: Hi Dr. Gerry! I've been looking a lot at gut balance and the microbiome. It's been a major problem for me. I used to weigh 300 pounds. I weigh closer to 200 pounds now so we both lost that 100 pounds and gut balance is a core part of it. What's your take on it? You studied in that topic. It's just about anyone can be. What's the connection between the gut and those things like your heart, your brain and your waist? Just give me the download there.

Gerard: In a nut shell I'll give you a little bit of my story, the journey and how I made the connection to the data. When I was going to college and I was about 293 is what I weighed and as they would say at the championship fights I weighed 293. When I went to see a doctor for mononucleosis and at that point in time I was interested in being physician which he found to be laughable. It was sobering. Really what I did was I went to the supermarket and I picked up a little book on fiber. It was all about how fiber was good for you and fiber can help you lose weight. I would combine that with yogurt. Different fibers, products and bran let's say oat bran and I just started to see the weight come off.

Twenty or 30 years later here we are I lost the weight and doing other things that were microbiome shifting. The data has really exploded. The connection between the microbiome and virtually every organ system and optimizing and controlling is really fascinating as you mentioned. If you really want to optimize our health, we got to start from within.

Dave: Why was it laughable that you were going to become a doctor back then?

Gerard: To him not really clear why but he said in his own words looking like that. To my mother, looking like that and then she asked question because I had a sore throat with the mononucleosis and found it difficult to eat and he found it to be therapeutic. You can use to drop a few pounds. The product of the medical school system back then perhaps or for whatever reason but the words were very penetrating and unforgettable. I definitely had motivation to succeed once I heard that.

Dave: Do you think that there's some ... I may put you on the spot here, is there some truth to the idea don't trust the fat physician?

Gerard: Don't trust maybe an obese weight loss doctor.

Dave: That's a fair point because I do know some obese physicians. If they're going to set my arm, great. They're going to tell me what to eat, it's like it doesn't work for you.

Gerard: That's right but there are bestsellers who do that. There are people who made the bestselling list sits, promoting books who are unfortunately who are overweight but that's the business.

Dave: It is. Speaking of the business, what about detox? When you have toxins in the guts, people talk about detox but there's also like the Betty Ford meaning of detox. As a Johns Hopkins guy, is detox a marketing thing or is this a real thing?

Gerard: It's funny it all depends. It all depends because the term detox is taken pretty negatively in the academic word. I remember giving a lecture to the American Dietetic Association on the center stage at one of their conferences about it. There's a lot of evidence for principles about detoxification. The problem is that you have the word detox applied and people do pretty crazy things and say they're detoxing then it may not be too healthy for them. Meaning the gut is a very robust, very resilient system and you don't want to starve it. You got to gently ... we cultivate it. You want to shock it.

Unfortunately with some of these detox approaches, you're doing yourself more harm than good. There is some truth and some benefit to really start to renew the gut and that's why I talk about in the balance revolution is how to do it in a phase system not as a onetime 10 day shock which unfortunately is promoted by many.

Dave: If you were to do a green smoothie cleanse and you only have green smoothies for 10 days or something like that, what's going to happen?

Gerard: Well what's going to happen is that your likely devoid of protein and you don't have glutamine to maintain your gut. You'll break down your gut integrity and the bacterial toxins will start to unfortunately penetrate into your blood system which his pro-inflammatory. As much as you're getting benefit from having a lot of greens which are phytonutrients, the confounding variable what's counterproductive is the fact that you're not supporting your system well enough and even prebiotics for your bacteria, the good bacteria to grow.

- Dave: When I was a raw vegan for almost a year it's hard to remember. It might have been 8 months or something like that. This is going back a while. The first experience benefits that are probably detox related but then soon started experiencing like "Well wait there's things going wrong I haven't had go wrong before. I have more allergies than I did before, more food sensitivities a lot more. My thyroid isn't working the way it used to." Sort of ground myself down through well-meaning efforts with stuff that kind of made sense on the surface but just didn't work. Do you see that a lot in integrative medicine where people have may be done more harm than good through attempting to detox?
- Gerard: What I've seen some people try to do in detoxing is do enemas. Once they've done a lot of high pressure enemas from below called hydrotherapy and I read it in and heard of a lot of case of perforation and dissemination, bacteremia and things like that where our bodies really weren't built for that. You can certainly "purge" yourself orally and not undergo a potentially harmful line of therapy but other people swear by it so other people feel great after having these cathartics but there are down sides that you don't hear about but they aren't published.
- Dave: It's funny. I learned the hard way with coffee enemas which are pretty popular for detox. You have to cool the coffee out first. Sorry it's an old joke. I do get people posting about coffee enemas. Well I suppose using a low toxin coffee is the way to go and there's some evidence for those. I've also seen people do crazy stuff with colon hydrotherapy that's probably not medically sounds and like you're saying you can do harm. There's supposed to be stuff growing there. If you wash it all out, what are you replacing it with and oftentimes in detoxes that seems like that's not part of it.
- What's the kind of detox that is real? What are the things you focus on if someone says ... well someone does have these lipopolysaccharides permeating from their gut. They haven't had enough of the right amino acids. Something not is right. How do you guide them to detox?
- Gerard: I think of a way and it's a line of medicine that you might heard about called functional medicine.

- Dave: Of course, yeah. We've had lots of functional medicine practitioners on.
- Gerard: There you go. The line of thinking that I also talk about in the book is A is to remove the toxins. Remove the things that are causing "toxicity" so the toxic foods get to be removed.
- Dave: You're removing from the diet or from the body is like the question?
- Gerard: From the diet.
- Dave: Okay. Love that.
- Gerard: Cut of the supply and don't purge the body of toxins that may be harboring in the gut. Cut of the supply of the pathogens by cutting of some of these bad foods. "The western diet" the highly glycemic foods, the foods that promote inflammatory fats and you don't want to have these bad bacteria fester and take over the gut because the gut was meant to really have a harmonious balance of symbiotic bacteria that make this thrive. I rather alter the diet and the diet will help heal the gut and help promote the right balance of bacteria. That in turn will help renew and regenerate your gut bacteria and your gut lining
- Dave: That's so important when people stop eating ... as soon as stop eating the crap. What about though this idea of calories? A lot of people will say "You want to lose weight, eat less, work out more." What's your take on that?
- Gerard: I have a patient that I saw earlier this morning who has been gaining weight. He's up in the almost mid 300s about 320 or so and his BMI, body mass index, is 45. As he has decreased his calorie intake, caloric intake and increase his exercise, he's been gaining weight.
- Dave: Oh that happened to me.
- Gerard: That's not unusual because what's happening is that as you're exercising, you're actually unless you're really doing it the right way, you're burning the lean body mass as much as you're burning fat. Fat and lean body mass metabolizes fat. In fact as you break down your gut from the lack of protein intake, your gut barrier starts to break down



and become more inflammatory. From a metabolic point of view, you look at Jonathan Bailor work you reach this set point and you're your body is smart and it slows down its metabolism. As you start to "lose weight initially" your metabolism slows down to counteract your measures to lose weight.

At some point if you use this calorie in, calorie out theory you're going to have a plateau. Actually the weight you're going to lose is going to be more muscle which is more vital to you and actually burns fat. Very few people find lasting success with that model.

Dave: It's funny because despite the fact that you might lose 20 pounds but you'll gain 30. Then you'll lose 30 but you'll gain 40 and it's brutal. Any fat person who's tried that will tell you this. It is the rule not the exception but you still see tons of ... usually relatively young people who have never been obese. You just stand up and say "Here's some studies that say it's always calories in, calories out and it's all about caloric balance."

My experience was I looked around one day when I weighed 300 pounds I worked out 6 days a week an hour and a half a day and up like "Wait a minute, all my friends are eating French fries and double cheese burgers. I'm having the chicken salad with no dressing. I eat less than all of them, I'm bigger than all of them and I can pick up all of my friends and bench press them and I'm still fat." I just realized you know what like I'm tilting at windmills here with this kind of stuff and that was one of my big wakeup calls. Why is that happening?

Gerard: It kind of goes back to the gut. What's happening is that when your bacteria out of balance they become more efficient at taking in and keeping those calories. Let's say you and I for example if we had a meal and one of us was heavy again, that never happens but if one of us was back when I was younger or you were younger and our bacteria were out of balance, those bacteria are very smart in trying to keep to metabolize the food that we take and make more efficiently you side of them calorically, absorb the calories, absorb the fat, convert the fiber to really short chain fatty acids which are really higher in calories than just the carbohydrates.

All together we're actually become more efficient at retaining calories if the gut bacteria are out of balance. That's the key. They found that in so many studies. First in animals around 2004, 2005. You can actually transplant the bacteria into the mice without any bacteria and make them fat when they're lean.

Dave: I reference that in the bulletproof diet for people who will say it's about calories. This is not possible. If you get a thin mouse put poop in him and he gets to be a fat mouse on the same food, it means it's not calories. Its perfect proof in any universe but people still don't see that.

Gerard: Even the obese individuals that are human their bacteria are summarily out of balance as what they found in the mice so it's true.

Dave: You're talking about the ratio of firmicutes to bacteroidetes those 2 species?

Gerard: That is correct.

Dave: Awesome.

Gerard: That is correct.

Dave: I was looking through a lot of research trying to figure out why I stumbled across "I'm trying to gain weight." I was trying to disprove the calorie thing. I was doing between 4000 and 4500 calories a day but I was doing almost all fat and a little bit of protein and some veggies. I thought I'm probably going to gain like 3 pounds a week but the mass I should gain 20 pounds and I'm just going to write about how this just doesn't work. I felt really good and actually grew abs like the only picture of my abs I ever posted was during that time. I saw stretchmarks from being fat and not like a cover model. I'm a dad.

It was really interesting because when I dug through why would I possibly have lost weight during this time. I came across this study from China where they fed mice butter and coffee and saw a shift in the gut biome. I don't know how they did the study. They found the shift of bacteroidetes and firmicutes which the so called fat people bacteria and thin people bacteria. The idea was that fat affects your gut biome. In

your work, have you looked at how fat or polyphenols in this case what they do to shift those ratios?

Gerard: It's interesting enough in my particular scope of work but in terms of research you write the polyphenols clearly are prebiotic. They will shift you into a more efficient metabolizing bacteria and you will not put as much weight on so these prebiotic friendly flora definitely help us stay lean. Also it's interesting with the fats and there used to be more research how the different types of fats promote the different types of bacteria shifts and metabolism. That's all pretty new at this point in time. I think it's all fascinating how the shifts in these bacteria can really determine the outcome of so many things with weight and diabetes being one of them but so many different illnesses even Parkinson's and Alzheimer's and all these things today are relating back to the gut microbiome.

Dave: If someone came to you today and said, 'I have Alzheimer's disease. What should I do to change my gut biome so I can maybe live longer or have better brain function?' Would you feel confident at least point them in a certain direction without being prescriptive? Do we know enough to at least say this is a wise move even if we don't know it's going to fix things?

Gerard: We know a few things that are associated with let's say arresting and/or promoting the onset of senile dementia. We know lack of sleep facilitates this development. A poor diet, a western diet or pro inflammatory diet believe or not the number of hours watching television and being sedentary but also the gut microbiome. There's many studies showing that again that you have more of these fat forming bug. These are more pro inflammatory. These again will be risk factors for developing disease. It's a bunch of data collected to look at the lifestyle that puts us more in a chronic disease mode and it's how we poorly treat that gut microbiome that's forgotten organ that is part of the story.

Dave: Would you tell them take a probiotic or would you tell them prebiotics? Would you tell them like I'm not asking for you to recommend any brand unless you feel comfortable with that or a species or something or

do we just not know enough to do that? Would you tell them eat more fat or would you tell them eat less fat? Would you tell obviously no artificial sweeteners I'm guessing but give me the directional thing not the perfect prescription thing you know what I mean?

Gerard: I like your question very open ended. I'm going to go in a couple of direction with your permission.

Dave: Please do.

Gerard: First let's talk about probiotics versus probiotic foods or prebiotic foods. I'm a believer my website being the foodmd.com really talks about food as medicine. The old saying by Hippocrates food is medicine. Medicine is food. Probiotics I think from my research point of view when they're pure and your quantitated really demonstrate the fact that these good gut bacteria have a powerful effect but in real life if you look at the different studies one by Consumer's Lab that showed only 8 out of 25 probiotics that they tested really has a number of viable bacteria that they said they did on the label.

New York state attorney general coming in, looking at various different supplements which are not labeled appropriately. I mean yeah in the probiotics theoretically could be very helpful in the studies and the different conditions like inflammatory bowel disease and even now somewhat obesity and IBS show benefit but these are in a research mode where we know that they're pure.

Life is like a box of chocolates as Forest Gump would say and probiotics is the same. You go to your store and you pick out this vial and you don't know really if its reliable enough to really say is this going to help me but food is a different story. Fermented foods, the Kiefer ... even the ones that are on the shelves are pretty robust and not always the yogurts. The Kiefer is... with hundreds of billions of bacteria per serving especially if you make it yourself.

Dave: I was actually about to say life is like a box of sauerkraut because you'll never know what you're going to get. You're using wild species like whatever was on there growing and you're hoping that you didn't get

the high histamine farmers and you're hoping you got the right ratio of lactic acid bacteria versus the other ones. Was the temperature and time and light exposure ... I've made buckets of sauerkraut that absolutely just knocked me on my ass. I'm sort of like okay. For me the food is great if they're fermented with the right species. That's been kind of a challenge. A lot of people who have post in the bulletproof forms are like "I like fermented foods but some of them really don't work. I don't feel good when I eat them but I eat them anyway." What's going on there?

Gerard: Everybody's guts are different. If you have what they call leaky gut and a lot of the academic docs hate that term but it really means is that your gut barrier is weak and your defenses are impaired. That certain let's say antigens and bacterial toxins have more free access to your bloodstream is that even the good bacteria on these probiotics foods that we just talked about that are pretty potent, you will find that they will also cause reactions because of some of them in their byproducts they're permeable. That's what could be going on in many of those people. I see that in my practice as well even with probiotics at high doses.

Dave: Do you recommend resistance starch as one of the things you might take with prebiotics? There's a big debate I mention this briefly in my book as well but it's still a debate about should you be taking corn starches and other starches that get into the gut to feed bacteria but may have other problems. Where do you land on that spectrum?

Gerard: Not that I'm a fan of corn starch in particular well I guess if its GMO, genetically modified. I think there's a number of ways by which we can boost the immunity and the microbiome together with as you just mentioned certainly arabinogalactans and prebiotic foods, artichokes and all kinds of fruits and vegetables. These are good boosters for the bacteria but people have different intolerances and there's a whole group of dietetics of foods called FODMAP. I don't know if you had it on your show.

Dave: Yeah we've talked about FODMAP's for sure.

Gerard: These are highly fermentable foods which can cause gas bloating and diarrhea because they're high in osmolality and so people ... there are foods with other let's say functionalities that may cause symptoms in people. The idea is I'll go slow and go slow when you start introducing new foods. Don't drink a whole quart of Kiefer and expect to feel wonderful. Some people will have adverse reactions.

Dave: I dug in on this because I'm a geek. I was really trying to figure this out. It turns out that when you're doing yogurt and dairy if you get *Lactobacillus bulgaricus* and I know you're super expert on this stuff. I also know that no expert I know has memorized all the different species so this is just a bad question. You just need to tell me like that's not the right question. I respect that greatly. There's *bulgaricus* and 2 other *lactobacillus* species including *Lactobacillus casei*. These are the most common yogurt ones. They form histamine in the gut.

If you're someone who has allergies, you might be even taking antihistamines and then you take yogurt then you start margin more histamine than you need already. I think this might be why some people don't do well on yogurt but if they can switch to *Lactobacillus plantarum* which is something that breaks down histamine it works. In my own gut I worked on getting a balance to reduce histamine sensitivity and I'm not very sensitive to histamine. Soy sauce doesn't knock me out anymore. That's a histamine food but it did at one time. Do you get to that level with patients? Do you see people who are that sensitive or I'm just like a delicate flower here?

Gerard: No, there are people who have histamine reactions clearly and they need to avoid foods that are high in histamine and even sometimes there are dietary supplements that actually have the enzyme which facilitate the breakdown of histamine which people improve on. Food sensitivity is a whole area with multiple mechanisms and gray science that are very challenging to deal with. I personally have shifted away in my practice from that as I see more and more people in functional medicine and more immunologist take that subject head on. There's a clear connection and the gut microbiome appear also through the immune system to be playing a role in that as well.

- Dave: What about artificial sweeteners things like Splenda or aspartame and acesulfame potassium? There's so many people who've heard the carbs are bad for you. Then they say "I'm just going to add this little packet of whatever artificial stuff to my bulletproof coffee or to my cheesecake whatever it is they're eating." They think it's going to benefit them because it has less calories in it. What is your take on it? What did you write about that in the Gut Balance Revolution?
- Gerard: It's an interesting question because back I believe it was 2008 for the Thanksgiving special I was interviewed by CBS here. Saccharine was discovered in Hopkins and they wanted to know was for the Thanksgiving special they want to talk about sweeteners and artificial sweeteners just for 1 or 2 minutes. They interviewed me for like an hour and I had all the papers and it was very compelling. They felt it was too good just for that segment. It got filed and never really got used again plus the lady who did the interview wind up ... now she's on Al Jazeera. She left CBS so therefore got canned.
- It led my mind into really doing research on this and what I've discovered over the year and particular over the last year is that there's a clear link between the ingestion of these NutraSweet's, these chameleon sweeteners and the onset of diabetes. The study that came out in February clearly show that the linkage was that these artificial sweeteners destroy your gut microbiome and through that promote the onset of diabetes. Here we are recommend the people to cut down on your sugar intake and substitute with artificial sweeteners. Yeah we're promoting diabetes because we're actually destroying your gut microbiome. It's really eye opening.
- Dave: One of the things that just drives me nuts is I went through this when I weight a lot. I said all right I'm going to ... I have to discover some Atkins kind of stuff in the early 90's. "All right I'm going to try this." but I of course used a lot of NutraSweet and then one day I figured out that the stuff made me completely pass out because it causes blood sugar swings and I was basically drooling on myself from NutraSweet. I finally got myself off that which took a while but then I switched to some other harmful sweetener and I ended up going on acesulfame potassium which is all of these are messing with my gut biome. I didn't know that

acesulfame potassium also causes benign nodules to grow in your thyroid which I got.

It's like that's probably 8 years of switching from one artificial sweetener to another because I believe that I had to cut calories or cut sugar. Well you do need to cut sugar but you need to not replace it with crappy sweeteners. If that message just got to a broader number of people it seems like a few companies wouldn't benefit very much from that like big chemical companies but like the national healthcare cost would go down by measurable percentage maybe double digit. Am I overstating that?

Gerard: No because soda consumptions of all type are really hazardous for your health and clearly been linked to obesity and diabetes especially in children. Carbonate beverages in general really make us acidic to a very small degree or lower our blood pH and that's going to reach our bones, our minerals by being acidic. That is one thing that all carbonated beverages do so you don't want to have too much of them anyway whether they got sugar in it or not.

Dave: Like sparkling mineral water?

Gerard: Unfortunately if it's carbonated not if naturally has gas in it. When you start pumping bicarbonate in it yeah you're going to have ... its carbonic acid. Look in Coca Cola it's phosphoric acid plus its carbonic acid. You can put it on a car and you'll see the paint strip glide off. It's very acidic.

Dave: Isn't that the same acid that we get from breathing carbon dioxide like as soon as it's in the body then it makes you absorb more oxygen?

Gerard: Right but you have buffers in your body to keep your pH neutral. You have protein buffers but if you start to go too low, where do you get it from? You get it from your bone.

Dave: Or you get it from oxygen. I want to do more research on this one. I'm definitely familiar with the phosphoric acids one of the reason to not drink soda but I've never ... I dug on this because I had a couple of clients who felt weak after drinking ... in mixed martial arts, they felt



weak drinking sparkling water but I have other people like me especially when I fly if I drink it, it does amazing things for me. My brain works much better when I drink bubbly water and I think it has to do with oxygen uptake but I don't have full evidence. You've inspired me to dig into that one. Is this something that you've done a lot of research on? Can I hit you up offline about that or it's something that I should just go and look at?

Gerard: We can talk about offline. I've done some post on it.

Dave: Okay. I'll check out your post.

Gerard: I have a brother who unfortunately he drinks nothing but seltzer and I worry about him. I send him a little material once in a while just to tickle his interest. Yeah I mean Pellegrino is a great thing. I order when I go out but I wouldn't take a whole case in just suck down Pellegrino all day for example.

Dave: That is interesting. I like it because it's a high sulfate water even though it's made by Nestle which does a lot of evil things. It's like whoa, what do you do there? I probably drink about a liter to a liter and a half a day and my system is almost too alkaline given all the other stuff I eat. Like I flirt with being hyper alkaline.

Gerard: Wow then you can tolerate that not someone who has a lot of red meat.

Dave: I have a lot of red meat. I had lamb chops for lunch but I don't have a lot of meat. I have moderate protein. Like I think people eat excessive amounts of proteins are just asking to die early. Enough protein to rebuild things and keep muscle mass but not it's not a good fuel source. You've peaked my interest on this one. I think this is due for some more research. I'll look at what you've written and I'll be sad if I had to drink less sparkling water. I will remain to be convinced but you had me really thinking. Thank you. Let's get back to the gut. When you drink sparkling water, does it mess with your gut bacteria? That's another request I don't know the answer to.

- Gerard: I don't know but actually a lot of us use it nice digestive aid because of its low acidity. You have that with the meal and you kind of like it's a digestive booster.
- Dave: Yeah it makes me feel good for sure when I drink. You crave it.
- Gerard: I just mentioned the brand. I have sparkling water when I'm out.
- Dave: I got a lot of flack because I recommend San Pellegrino because of Dr. Stephanie. When Dr. Stephanie Seneff came on we talked about sulfate. There's only one mineral water that has high sulfate levels and that's it. Anyone who knows my work knows I don't really stand for big companies doing bad things at the same time it's like you had to drink something and tap water was really a bad idea so ...
- Gerard: I got you.
- Dave: Now let's say that one of our listeners today that probably sitting at work listening to this and they're going "All right so these guys are talking about sparkling water and gut biome, sweeteners are bad." They got the message. I'm like, "Okay but I know I have bacteria in my gut and I know I probably have the wrong ones or the bad ones or there's a reason my pants have to be this big so maybe I have the bad bacteria." What do I do right now in order to give me thin people bacteria for lack of a more nuanced way of asking the question?
- Gerard: The way I do it and I recommend that people do it is like a 3R approach. It's first we want to ... you appreciate this. Reboot, if you got a malfunctioning computer we all have that on occasions. We want to reboot it. We want to reset the body metabolism. To do that as we had discussed about "detox" is you want to really reset the metabolism by going on a more ketogenic diet. It's something you're very ...
- Dave: We agree on that one.
- Gerard: At the same time though you want to cut off the really the bad carbs and the bad inflammatory fats so that the bad bacteria don't proliferate. It's like you have a garden and you want to weed out some of the bad bacteria and you want to then recultivate and refertilize. Then you start

to replant or you start to rebalance and we put in the good bacteria and a fertilizer for them in the second phase. That's what the good pre and probiotic foods that we've been alluding to. Final phase maintenance and I think you really like this is, is that there's been a lot of studies on Mediterranean diet with preventing Alzheimer's and cardiovascular disease but also to sustain weight loss. There is a study that I site in the book that clearly shows that if you alternate that ketogenic diet with the Mediterranean diet that's the best for sustaining weight loss.

Dave: The cyclical ketosis thing. It works.

Gerard: That's what we're looking at in the program and people swear by it rather than swear at it. I'm getting a lot of good feedback. You go look on Amazon. You go look on my Facebook I'm very, very thrilled that this is working out for a lot of people.

Dave: How long do you recommend people stay in ketosis before they switch to Mediterranean where they'll eat enough things to be out of ketosis?

Gerard: It's interesting because you got another phase in between. Really when people go in and start refeeding, it depends on how much weight you want to lose and I think that's where it becomes more individualized. Generally if you want to lose maybe 10, 20 pounds you're only going to be it for a month or 2 before you switch over and then you're going to find you're going to still lose weight because you really cultivated this new bacteria and now you're continuing to foster because the Mediterranean diet also has fermented foods where you've got yogurt and cheeses and all kinds of vegetables and fruits in the Mediterranean diet. It depends when you really want to plateau.

Dave: What happens if you stay in ketosis for months and months on end without breaking it?

Gerard: You're going to feel less hungry.

Dave: That's for sure.

Gerard: You're going to lose weight. For some people who already have kidney failure that's where you really want to be careful.

Dave: Yeah that's like part of the case.

Gerard: Otherwise I don't really see too much of a downside. In fact there's potential therapeutic benefit with cancer. There've been studies on the ketogenic diet, seizures ...

Dave: Dominic D'Agostino has come on the show. We talked about that a little bit.

Gerard: You're familiar with it?

Dave: I am but it's just for listeners. Keep going. I was guessing you were referencing his work and for people who are listening they would like to hear that episode.

Gerard: Sure.

Dave: You're seeing epilepsy and cancer. The reason, what I'm digging for there is in the course of research for my book I did about 3 months of extreme ketosis. I ate 1 serving of green vegetables a day and the rest was fat and protein. I was trying to replicate the Eskimo diet. Lots of krill oil and things like that. Lots of butter like anything to do to get the calories in because I was trying to do a high calorie, high fat kind of thing. Towards the end of that 3 months my sleep monitor showed I was waking up 12 times a night without being aware of it. I never felt rested. My eyes were constantly dry. My sinuses were constantly dry. I got food allergies to some of my favorite foods which sucked. I've just about eliminated those a couple of years later.

What I think happened was that I was so low on carbs that I couldn't make mucus. I didn't have a mucus lining for my stomach. I gave myself leaky gut. I couldn't make tears to keep my eyes and mucus to keep my sinuses moist because I was just so into ketosis and so devoid of carbs. I've seen other people who were in ketosis for long periods of time particularly women. They lose their period. They stop menstruating and they can have adrenal issues.

On the other hand those guys like Jimmy Moore who's a good friend he'll be in ketosis for like 200 years and he'll probably live that long. I think

there's individual variation there but because you see patients and I clearly don't I'm not a doctor I'm a hacker. What spectrum do you see there? How much ketosis is enough? What's your nuance to ... I see patients answer to that?

Gerard: I haven't seen a lot of people on very long term ketosis and to the extreme amount that you're talking about. People generally try at least they get under 50 grams of carbs a day and some feel a little tired at the beginning and some feel very energized. I see people have different reactions to it. I think you're right. I think it all depends on the resilience of your microbiome whether you have a leaky gut or not. There's a lot of factors underlying health on how you react to that ketogenic diet. I think that plays a factor as well which is hard to have a denominator. Sorry about that I can't control the calls in.

Dave: Don't worry about it. You're in an actual medical office. For people watching you can tell you're there at work and for people listening now you know he's in his office. I appreciate taking time out of your day for it.

Gerard: It's cool.

Dave: You've written some other things about super foods for weight loss.

Gerard: Yes.

Dave: What are those? Superfoods are one of those marketing labels like I've been probably seen white flower labeled a superfood at this point but what are the ones that are real superfoods that you recommend?

Gerard: It's funny and we keep referring to the book is that in each phase I have 10 superfoods for each phase. In other words blueberries which are again these are high in polyphenols. They're prebiotic. They're antioxidant. Cinnamon which you can actually flavor your coffee with which is really one of the highest concentrated antioxidant foods that are available with take the spices. It also regulates blood sugar. These are the kind of things that I talk about the coffee is one of them. The superfoods, right?

- Dave: We definitely agree on that one.
- Gerard: I know that gets your interest. I talk all about coffee and the diabetes, cardiovascular disease, thermogenesis, different metabolism. Strangely enough gallbladder disease is lowered with coffee and liver disease is lowered with coffee. There's a number you can have a whole show you probably have on the medical benefits of coffee.
- Dave: I'd love to have a show on that but according to the way things are in the US if I ran a show on that I'd be making medical claims for my own product so there's actually like a legal guide ...
- Gerard: Really?
- Dave: I'm not even allowed to link this with the positive research about coffee. It's probably stuff that you wrote about in your book. I can talk about human performance in coffee but if I want to talk about the real big gun stuff that coffee does, not allowed. It's frustrating as someone who's I'm here to help. I just want to link to the studies but it's a conundrum.
- Gerard: Strange freedom of speech. Even your guest you can't ...
- Dave: My guest can talk about it but I ...
- Gerard: Like I just did.
- Dave: It's fine if you do but I wasn't expecting you turn this but if I went out and did that I would be breaking some regulations there. In fact one of my consultant said "Oh no you're in the era of controlled speech and not free speech." I was like, "What? What word do I live in here?" Yes sometimes I ... sometimes I'd really like to tell people about coffee but someone else will them that so thanks for putting all of that in your book I appreciate it.
- Gerard: I just did. I think next blog on it that I believe you seen on my website all about the coffee and its benefits.
- Dave: Yeah it was pretty cool. I love what you said actually. I was going to ask you about it but you were talking about ... we should see a randomized

trial of bulletproof coffee as a breakfast beverage. I'm actually interested in doing that so I'm looking to fund some research on a couple of different things I do. There's some mitochondrial enhancement stuff that's really important that's a part of what makes me tick every day. I'm getting to the stage where I can afford to start funding research like that I just need to find who can help me with that so I think it's worth doing.

Maybe hook up with uBiome and see ... I had not enough data but I did send in my poop in. We helped uBiome get their funding as the first bulletproof biohacking conference about 3 years ago. I had a free sample and my ... one of my 6 theories about why bulletproof coffee does weird stuff was this ratio of bacteroidetes to firmicutes so I only had 2 samples from one of the other bulletproof guys and me and just not enough to put in my book but the samples did show lowered firmicutes and higher bacteroidetes which is what you expect for microbiome effect from that beverage like that.

The hypothesis and the animal studies say it and we saw it in 2 people but that wasn't enough to make a chapter in a book. I would love to like just know for sure because maybe it has nothing to do with that but I do know it works dramatically. It's frustrating to have a bunch of hypothesis about why something works when you know it works but to not know for sure which one or which ones so the ones that have big effects versus no effects. That's just a big knot of knowledge to untangle but I think it's worth understanding.

Gerard: I agree.

Dave: Did you do any particular randomized things for your book or were you mostly looking at clinical experience like did you put together a trial or anything?

Gerard: No. what I did was really organize the data and I had a hard time keeping up quite honestly. I drove my editors crazy at Rodale with production deadlines. I was always the data just explodes almost weekly about the connection the biome, the foods and outcome studies just like you're alluding to.

- Dave: Rodale is a good publisher for that. They also published the bulletproof diet so ...
- Gerard: Yes that's right.
- Dave: A lot of people listening probably wouldn't understand who impactful it is to work with someone who helps you get the knowledge out there. Some publishers are just like turn the crank and make a buck and others are really committed to health. I was a virgin author. I really didn't know what the heck I was doing. Man I was grateful that I was able to include some last minute stuff because you're like "Oh my God here's a study that what I thought was there didn't happen." Literally sometimes it was an hour before the deadline when I would send it in. I'm guessing you're the same way.
- Gerard: Yeah and one of them was like midnight plus 8 minutes and it was due at midnight. That was yeah crazy stuff as you can imagine.
- Dave: I have a confession to make. When I was doing one of the final big editing runs for several days in a row I slept 2 hours a night. I had basically stayed up until 7 am. Slept from 7 to 9, woke up, cranked through. I was using all sorts of interesting biohacking technologies. I was using colored lights for mitochondrial enhancement and basically pulled out all the stops. I was in a flow state almost the entire time and I wrote some seems tens of thousands of new words that needed to be added but its biological expensive so I was taking adrenals and what not. You had to have lost out some sleep when you're writing your book.
- Gerard: There's no question.
- Dave: It's like having a baby.
- Gerard: There's no question.
- Dave: What did you do to stay resilient when you're writing your book? This is a stuff no one ever talks about. I'm sure everyone wants to know that because everyone misses out on sleep when they have a big project.



Gerard: It was a long, long project and I had a lot of going on with work and everything else. What unfortunately I found that on the weekends had some sanctity. I always had a recovery sleep and that's when I was at my highest functioning for the book. Recovery sleep and I would just work strictly on the book. Those are my weekends for quite some time for over a year with my holidays and family things. During the week my sleep was also very sacred because I'm taking care of patients so I made sure I had enough sleep during the week. On the weekends is when I really compensated and stayed up late and so on and so forth. It was all a bit of a balancing act with sleep.

Dave: Did you take any specific supplements or anything like that or change your food at all?

Gerard: I put myself on my program just for the sake of it more than once particularly after holidays. You put on 5 pounds, I lose it almost effortlessly. Yes, I also I found myself really heavily and ever since then on salmon really heavy on my diet because basically one of my dishes is Gerry's salmon salad which actually became a dish at this restaurant that I talk about in the book. Since then just about I wouldn't say everyday but close to it I had definitely have fish and I found myself even more vital and more functional. I think that was one of the key changes. Omega 3 so I'm really on a high omega 3 diet at this point.

Dave: Do you ever worry about being so high on omega 3s that your cell membrane ratio kind of get shifted negatively?

Gerard: I'd have to test that out. I really have to test that out because you want to have a full spectrum of essential fatty acids. I also really I do quite a bit of olive oil as another fat.

Dave: You probably get some omega 6's there.

Gerard: Some dairy in the form of yogurt so I do have balance but I try to keep the omega 3's really cranking.

Dave: It's a good idea and there's some people out there if you have enough DHA you can walk through lava and you'll be fine. It's like well DHA for

the mitochondria is good but too much DHA for the outer cell membrane seems like it can actually disrupt things. There was a time when I got my ratio of omega 6 to omega 3 and for people listening this is a bit geeky but omega 6's are pro inflammatory but you need some in yourselves and omega 3's are anti-inflammatory and those are good ones.

I got my ratio down to 1.28 to 1 and the anti aging guys recommend 4 to 1 and if you eat an American normal diet your ratio are 40 to 1 with more inflammation and very little anti-inflammatory. I went so far into anti-inflammation that I was probably the second lowest reading that I've ever seen. The lowest reading by the way is Dr. Larry Smarr from UC San Diego who's another biohacker who looks at gut biome I'm sure you must be familiar with his work, right?

Gerard: I've heard of him.

Dave: His ratio is 1 to 1. I'm like "Darn you beat me." It may not be healthy to go that low and I find a signal can get that low unless they're doing pretty unusual diet and things like that. That's one of those concerns that I'm starting to ask experts like you because I think high omega 3 is good. Crazy high omega 3 maybe isn't so good but I don't think we know what crazy high is yet so that's one of those interesting questions. Does omega 3 affect your gut biome is the other big question. Do you know anything about that?

Gerard: Recent study shows that it does, the fat burning metabolism through the gut yes.

Dave: It's fantastic.

Gerard: Amazing.

Dave: Is there actually a value to going out and doing something like a uBiome genetic analysis of your gut given that every meal changes your gut bacteria so profoundly?

Gerard: Yeah I mean within 24 hours you can destroy yourself quite quickly on a western diet and it does take a little time to build it back up but you're

right it's ... you want to have something that's stable and resilient at the same time and that takes work especially in today's every day living. Most people eat 50% of meals are eaten outside of the home.

Dave: Then you don't know what you're getting at all.

Gerard: Box of chocolates.

Dave: Nice. I'm tempted to get 6 months' worth of uBiome kits and then record everything I eat for 6 months and spend an awful lot of time putting little cue tips in vials but then I've had to crunch the data and that would be too much work. I would collect it but I would never crunch it because of life, but I'm hoping that we do get some studies like that. uBiome is really cranking up their game. Have you done or do you recommend one sort of genetic test for your gut bacteria or any one particular way that people can quantify their gut bacteria? I'm just using because I know them but there's American gut project and you've probably used some clinical stuff that's way better.

Gerard: It's a really good question because the technology came out about 8 or so years ago with a company and looking at you've mentioned the firmicutes and bacteroidetes and that was kind of the obesity and the ... looking at pathogens using PCR. When that became new and all the criminology shows started to use DNA testing and PCR so the doctors did it too. Now as they perfected it, the same company who looks more at biodiversity it'll look at pathogens and look at as you've mentioned somebody's organisms but also biodiversity's key because if you want to live a long healthy life you have to have an enhanced biodiversity.

As we get sick and old we have a limited biodiversity antibiotics limited biodiversity so there are some companies now that look specifically at what I just been talking about the biodiversity which I think is key as well as the different species as you just mentioned with uBiome.

Dave: It's early days. I felt like it's the home brew computer club time from when we first invented PC's but now we're doing it for what's going on in the gut. It's so incredibly exciting and there's so much we don't know. I'm thankful that you put together what we do know into the Gut

Balance Revolution so people can basically say here's what we know we think we know anyway and this is directionally accurate the things that we could do. There's question I'm sort of winding things up because I know that you're in the middle of your work day.

There's a question that I've asked everyone who's been on the show and it's based on your knowledge not just from work but like your life's path including that doctor who told you about how you weren't going to be a doctor not looking like that. Whatever else it was but given all of that knowledge, the top 3 recommendations you'd make for someone who walked in the door and said "I want to be a better human being. I want to perform at everything. What should I do?"

Gerard: There's a lot of facets or elements to health. I keep on having the Rs come up in my head is about relax which means destress and also sleeping. This kind of your body has to be able to unwind, how we eat. We've been talking about all through this interview. Eating better, relaxation, having balance in your life and building up resilience and I think those are really the keys to really living a longer and healthy life. Also having a healthy social life because in many study showing those who are isolated do much poorly than those who have a really good social network so you want to have a very healthy social network as you go on in life. I think those are some of the keys that I see come up.

Dave: Thanks. I'm waiting for the study that shows that having a healthy social network actually means your gut biome makes better stuff because there's probably a connection.

Gerard: That may be. There may be because there's days about how at least in caged animals how they exchange their microbiomes and how you can actually have a lean mice help an obese mice get leaner with the right diet because they exchange their microbiomes to some extent.

Dave: There are studies that say fat friends you're more likely to be fat. That could be a gut bacteria transfer thing. I'm not saying don't hang out with fat people. I'm saying when hanging fat people, help them be thin. It's doable. We have the technology. Awesome! Thanks for your work and thanks for being on bulletproof radio. Would you tell listeners where

they can find your book? Say the title again and give me a url where you want people to go.

Gerard: The Gut Balance Revolution, they can go to the foodmd.com where I talk more about myself, my blogs and give information about the book and Amazon, Barnes and Noble, Indie all these different book sites or at their local bookstore.

Dave: Dr. Gerry Mullin thanks for being on Bulletproof Radio have an awesome afternoon.

Gerard: Yeah you too. My pleasure.

Dave: If you enjoyed today's episode do me a favor go and check out Dr. Gerry's work. These are people who have spent months and sometimes year or decades pulling together knowledge. It's a really big thing when you decide to write a book because it takes hundreds or even thousands of hours. It's actually harder to write the book because you're boiling all this knowledge down of all these things just choosing the most important things to share. It's a big active creation.

If you enjoyed this episode, you learned something from it, you want to learn more, the best way you can say thanks is buy the book and then go out there and give it a good review. That means more to authors like Dr. Gerry and me than you probably know. While you're at it, I really appreciate it when you go out on iTunes and say "Hey Bulletproof Radio rocks." Give us a good review too on there that goes a long way. Have an awesome day.

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