

Nicki: It's time to make your health an act of rebellion. We're tackling personalized nutrition, metabolic flexibility, resilient aging, and answering your diet and lifestyle questions. This is the only show with the bold aim to help one million people liberate themselves from the sick care system. You're listening to The Healthy Rebellion Radio. The contents of this show are for entertainment and educational purposes only nothing. In this podcast should be considered medical advice. Please consult your licensed and credentialed functional medicine practitioner before embarking on any health, dietary or fitness change. Warning when Robb gets passionate, he's been known to use the occasional expletive. If foul language is not your thing, if it gets your britches in a bunch, well, there's always Disney Plus. Hello everyone. Welcome to episode 124 of The Healthy Rebellion Radio. We are back on a wet and rainy Northwestern Montana day.

Robb: We are.

Nicki: We are. We're getting a lot of rain actually. It's quite good. All last night, constant rain, all day today and then I think we get a week or two at least of some nice sunshine.

Robb: But fall has fallen.

Nicki: Fall has fallen. Yeah.

Robb: And winter is coming.

Nicki: It is. We're not quite sure what kind of a winter we're going to get, but it's coming nonetheless. We've had an interesting week. I had dogs as a kid. Our family dog passed away when I was 16, I think, and then I haven't had a dog again since Dutch and Dutch is now six years old. And I learned something for the very first time in my entire life and that that dogs have anal glands that sometimes can be problematic. And how I know this is that we... so long story short, our dog has had a very stinky rear end for the last couple of days and the girls were like, "Mom," they started calling him stinky butt, they gave him a bath still wasn't resolving. And then we were noticing some excretion type stuff on the carpet and then that was like, "Okay, what is this? This is a problem." Did some Googling. This was over a weekend, of course. So there's no vet option at this point.

Robb: Everything always goes sideways on the weekend with the fucking animals.

Nicki: It always happens on a... Yes. Yes.

Robb: Yeah. Yeah.

Nicki: So learned that there is such a thing called an anal gland, that it basically is what puts scent on the dog's poop so that dogs can know that it's a particular dog's-

Robb: "Oh, that's Dutch."

Nicki: ... poop. Yep. But they can get irritated and rupture even. And so the symptoms are normally scooting around a lot, licking a lot. He was doing none of that. Yeah. Anyway, long story short had to take him to the vet on Monday where one had ruptured, the other one she expressed. So expressing anal glands is a thing. And we had people in the Rebellion, we did a live chat and one woman was sharing how during apparently groomers do this and maybe this is why I don't know about it because we don't get Dutch groomed. But yeah, apparently groomers do it and over COVID since groomers weren't really doing... they weren't open for business, like many other establishments,

she had to learn how to do this on her own. Yeah. So anyway, we're on the downhill slide of that. Antibiotics.

Robb: And what has been question around this whole thing?

Nicki: Yes, and I agree with you on this one. What is the upside of pet ownership?

Robb: No, no, no. That's like the broad thing. Specific to this deal, what has been my question?

Nicki: I don't remember.

Robb: How do I get my anal glands expresses?

Nicki: Oh, Jesus.

Robb: What's a Wolff got to do get a little action like this. I mean, when they were like, "Oh yeah, our dog groomer does this all the time." I'm like, "Well, what do I need to do to explore this?"

Nicki: Yeah. Anyway, if you have dogs and you didn't know, my dad didn't even know about it. After I was sharing what was going on with Dutch, he did... And he's had dogs his whole life. So I don't know. So apparently here's what happened, because again, we've had Dutch for six years, nothing. So apparently it's more common in small breeds and also in overweight dogs. And because we just got Griz, there's been a lot more treats in the house and Dutch has gained and he doesn't look it.

Robb: Cause he's a big dog.

Nicki: I was shocked cause we took him to the vet and he stepped on the scale and it said 125 pounds. And I'm like, "There's no way." The most he's ever weighed was 110 and then he's been hovering around 105. Robb stepped on the scale. It looks like it was not calibrated properly.

Robb: It was reading five heavy.

Nicki: It was like five pounds over. So they ended up putting 120 in his chart, but that's a 10 to 15 pound weight gain. And he's a big dog so you don't notice it. He doesn't look fat, but it's the extra treats that we've been using to train Griz and then of course Dutch is there and he can sit and spin and shake and all those things too. So he's been getting lots of extra treats. And so now we're on the...

Robb: The Dutch lean out program.

Nicki: The Dutch lean out program for sure. Yeah. Anyway, that's a long, long tangent of what's been going on with us this week. Otherwise, let's see. The Rebel Reset is in full swing. We had our food call last Friday. This is the week of all things food. This coming Friday or the day this episode is released is the sleep call. So just full swing ahead with the Rebel Reset. Let's see, anything else we want to talk about?

Robb: You have a prompt there, but I don't know.

Nicki: I have a prompt here, but I didn't know if you were game for it or not.

Robb: I can.

Nicki: You are? Okay.

Robb: I can.

Nicki: Robb, yesterday morning I called him Oscar.

Robb: The Grouch.

Nicki: The Grouch, because he was like just-

Robb: I was a complete dick yesterday.

Nicki: Being a shnark, like every little thing, just-

Robb: With kids, with everything. Yeah.

Nicki: It was not even like 9:30, we'd just barely getting the day going and just, I'm like, "Okay, Oscar." And he's like, "Ugh, you know what? That's spot on." And then he proceeded to share what was... where his mind was and why he was acting the way he was and I don't know do you want to dig into that?

Robb: Do you want to share some of it or?

Nicki: Okay. Well, so you-

Robb: You're staging it well.

Nicki: I'm staging it. Okay.

Robb: Yeah. Yeah.

Nicki: So he doesn't spend a whole lot of time on social media, but he-

Robb: I've deleted the apps for a long time and I try to avoid going online at all costs on social media.

Nicki: Right. But he had posted something or LMNT had him look at something or there was something-

Robb: Well no, this time it was the COO of Beyond Meat bit a guy's nose and I just couldn't... He got into a fight after a football game and the guy just looks like a big cranky piece of shit anyway and so I couldn't resist and it actually pulled me on, I downloaded the app for Instagram.

Nicki: Some people are saying he... Cause it's like okay, you're fighting, when do you go from punches to biting, deciding that it would be a better idea to go bite something on their face and people are like, "Oh, maybe he's hungry for some real protein or something." Anyway, so yeah, you went on for that and then you...

Robb: And normally I would post and delete immediately. And if anybody listening follows me on Instagram, you'll notice that there's just not a lot of activity because I find the whole thing pretty repulsive and I'm probably part of the repulsiveness at this point, but it's just the shit that gets attention to me is so ridiculous that it's literally nauseating and then I'm just kind of like, "I don't really know..." And then half the time, if I feel like if I

put something thoughtful down there, the responses are so again, ridiculous. Oftentimes there's some very engaging, thoughtful stuff, but then you get enough knuckleheads and you're just like, "Fuck, why did I even bother with this?" So normally I delete the app, but I didn't. And I had to go do some heavy moving in the water closet and foolishly, foolishly looked into Instagram and one of the folks that I guess, ostensibly I'm friends with, we've been in this health space for quite some time, had a long post, lots of pictures, slides and lots of grievances against the world.

Robb: Some of it was... It's fair to say that this person is very social justice oriented and I'm not opposed to that. What I oftentimes do get opposed to is the modality in which people think that they're enacting social justice. I think a lot of what people do is infantile and it's actually treatment or symptom chasing ironically, these people that are in this alternative medicine space and are knowledgeable about evolutionary biology. And I think a lot of these social ills, a lot of these challenges I personally, and not just personal opinion, I think I could build a credible case, that a lot of this stuff, the way that folks go about trying to address it is symptom chasing. But one of the things that this person mentioned was that, and again, there was probably five or 10 different pictures, you know little memes and there was a statement about the shortcomings of the world.

Robb: And one of them was that she had had a conversation with a prominent person in the paleo scene and that they had said that welfare recipients were just these grifters just sponging off of the system. And I'm pretty sure she was talking about me. And I'm certain that that is not what I said because I remember this conversation and what I did say, because I've been kind of noodling on a post about this because I was a welfare kid. I still have, and sometimes carry around, an actual food stamp. There was a time when you weren't able to pull out a card that looked indistinguishable from a credit card or a debit card and buy things via welfare. You had things that were obviously part of the welfare system and there was a fair amount of shame and guilt associated with it. Maybe right, maybe wrong. I don't know.

Robb: And again, I'm going to talk about this stuff in a post that I will eventually do, but I determined as a kid that I was never going to be a part of that system, by hook or by crook, I just wasn't going to do it. And God bless my family, but a lot of my family has turned into a multi-generational trap with this stuff. And I've observed that welfare can be an amazing thing under the right circumstances, but it can turn into a multi-generational trap and there are people who abuse the system. And I think if you argue contrary to that, that's ridiculous. But the deeper story there is that the path to hell is paved on good intentions and sometimes those good intentions can end up being more damaging than not. I saw welfare destroy the soul of my father, in particular, and again, that's kind of a whole story that it really does need to be unpacked and told, and maybe it's just my own cathartic thing.

Robb: But anyway, I posted to this person's timeline. I'm like, "I hope you're not talking about me, and if you are, my sentiment was that welfare can be both a safety net and a multi-generational trap." And I left it at that. I haven't gone back there, but goddamn if my mental space wasn't completely consumed with this and it put me in a terrible mood, not present for my family, not present for myself, cranky irritable. And what I said to Nicki was just that I don't know sometimes when... Some people would just say, "Well, it's not worth it pushing back against that stuff." And maybe it's not. Certainly the cost was not worth whatever this outcome was, but there's also been the reality that I've pushed back on a lot of different topics and maybe I'm right, maybe I'm wrong, but part of me learning to not be wrong is having other people push back and then there's a dialogue and you can learn at least there was a time like that before cancel culture in

which if you didn't have a certain prescribed set of mores, beliefs, values, then you were basically shut down.

Robb: So I don't know when it's worth it to push back on that stuff. We've had people reach out to me and they're like... I started thinking about things differently. I started reading about economics and it had the same kind of impact on my life as learning about evolutionary biology did and I had looked at the world in a really simplistic way. So in some regards I kind of feel like it's a moral obligation to speak up and set some things right like that, but then at what personal cost? And so Nicki and I talked about that. And again, I don't know if this is the least bit interesting to anybody listening, if anybody is still listening, but you know.

Nicki: Well, it's certainly a struggle, right, because in order to push back or to share those thoughts, you have to participate in these types of platforms or you write it on sub stack, but then... I don't know, then it's the time that you need to find in order to write something that's well reasoned and thought out and it takes time. So, it is sort of a quandary. How much good are you doing versus is it just sort peeing into the wind and what is that taking away from your in the moment? Does it mean that you don't train or you don't go to jujitsu or you don't read?

Robb: Or I wasn't present for my kids.

Nicki: You weren't present for your kids because you're noodling on something that's sort of contentious. So I don't know, we don't have a good answer, it's just sort of... It's tricky. It's complicated.

Robb: It's complicated, very first world problem stuff, but it... I really... I guess part of the thing, the same person when we were having a discussion, and I think the discussion was around minimum wage, I was talking about some kind of big macroeconomic kind of things and she said, "Well, you just don't care the way that I care." And this person's known me, they got their career start because of the work that I've done and I mean, they wouldn't be doing what they're doing and I'm grateful for what this person has done. She has taken the autoimmune concept and really dug in deep and pushed it forward and everything. But I was so taken aback by that. Just because I'm not ruled by emotion doesn't mean that I don't operate with some emotion.

Nicki: That you don't have them.

Robb: And there's also, what I would push back on that, is that the knee-jerk reaction, hyper-emotional response to everything, doesn't leave a lot of room for understanding secondary, tertiary, quaternary ramifications to decisions and that things are complex and that there are oftentimes root cause issues that are different than what we're actually looking around at. And it was amazing to me that this person would look at me and would look at the body of work that I've done and would assume that I don't really care about helping people. That's why I fucking do any of it. This is why I speak up about any of this stuff, because... And again, maybe I'm wrong about all of it, but my intent is to help people look at the world in a way so that we minimize suffering. Period. Like that's it. And part of that is that I hope that by putting things out there when and where I'm wrong about things, I get some feedback and I can grow and iterate and all that stuff. But anyway, it's interesting. Yeah.

Nicki: Yes. Happy to report though that after we had that little chat, Oscar went back in his trash can and I had my Robb again.

Robb: Not to be seen again. Yes.

Nicki: Yes. Okay. I think that's all of our beginning stuff. What's our news topic today?

Robb: So there was a piece that, funny enough, I did a short little blurb online about, it's about the rise and fall of F45. This is one of these Johnny Come Lately, CrossFit attempts at CrossFit 2.0 it was a franchise model and whatnot and it's a really well written article on a lot of different levels. One of them, again, is kind of the bigger macroeconomic picture, which is that people drunk with money and power who had no good sense, dumped ungodly amounts of money into this thing. They had an IPO and then the people running F45 did ridiculous stuff with the money. Eight figure, A-lister endorsement deals here and there and everywhere, all the while doing really nothing to help the people that are running their gyms.

Robb: And the piece that I did was basically talking about whether it's F45 or even the current CrossFit leadership, I had some high hopes when Eric Roza bought the business from Greg Glassman that there would be some realization about that the only real asset and the only real important thing about CrossFit is the affiliates. And there's not movement there, in my opinion. They have some folks that are starting to run some sort of a business seminar type thing. They're very nice people, I have no gripes or grievances with them individually. They've never run a successful business. There are lots of people out there that have run successful gyms, multiple successful gyms and there's different ways of doing it.

Robb: If there was a franchise model that the CrossFit Inc wanted to roll out there, I guess I'd be okay with that, but I would encourage him to pick five or eight different business modules and compete them all against one another and then have these entities show what the profitability is per square foot, show what the conversion rates are, phone call, email, walk in, there's all these opportunities. People should be it heavily encouraged to own the building that they are in because that's the only goddamn asset they're going to have throughout this whole process. And there's none of that going on. There's been some noise here and there about it, but there's none of that going on.

Nicki: And some affiliate owners are doing that independently, but that has never been the message coming from on high.

Robb: That message has been outright squashed under the great Glassman regime, black box summit and all the rest of that. And something that was interesting to me is a few folks, when I posted this, a few folks that run pretty good gyms are like, "Well, I'm doing great and I'm happy with what it is." And it's like, Well, that's great for you, but there are people who have second mortgaged their house and they've done this and they've done that," and maybe they were just idiots or maybe they were like all of us getting into this thing and they did all the same stupid mistakes and all of that... There's going to be some amount of failure and attrition with any bank, anything, but there are some best practices. You don't do a one week free, you don't take anybody in off the street. You need a development program. You need personal training, you need this, you need that. There are just some non-negotiable features to it.

Robb: But anyway, if you care about CrossFit, if you care about group fitness, I would read this thing and it's also a little bit of an insight into the unraveling of the current financial world, because the cheap, dumb money, and I wish I could use a different word, but I can't, but this cheap, dumb money is gone and what we're finding is that a ton of shit that was out there, a ton of businesses, and I think it's going to range from Uber to all kinds of different tech darlings, we're bullshit. They were predicated on complete

bullshit to start off with because there was never a thought towards profitability because there's been a decade or more of just money getting dumped into this stuff and it's gone and there's going to be some real heartache over this stuff.

Robb: So it's kind of an insight into that and it's definitely an insight into the failure of this amazing opportunity to be realized of developing this group fitness model into a legitimate professionalization that could be the interface between healthcare and wellness. And that is the huge failure here. The Reno risk assessment program where we saved the city 22 million dollars in a 33 to one return on investment, something like that could get plugged into this whole scene and you could partner these gyms with healthcare systems with, I would argue, medi shares over insurance, but you know, can dicker over that. There's an enormous opportunity here. I've been trying to do it. I don't even care if I'm involved with it at this point. I just want somebody to do it. But I think it's interesting. I think it's valuable. I think it's important thing. I don't think that ship has 100% sailed yet, but it's pretty goddamn close.

Nicki: Does it say that I've been living under a rock that I have never heard of F45?

Robb: Never even heard of F45. Yeah. I mean, it was huge. They had a lot of affiliates and now they laid off something like 70% of their workforce and the franchises are closing fast.

Nicki: Wow. Wow. Okay. The Healthy Rebellion Radio is sponsored by our salty AF electrolyte company LMNT. And if you follow a low carb or ketogenic diet, electrolytes matter. If you're active or have a physical job, electrolytes matter. And if you live in a hot or humid environment, electrolytes matter. And if you find yourself getting muscle cramps or feeling fatigue throughout the day, you guessed it, it might just be that you need more electrolytes, particularly sodium. And LMNT makes the tastiest, no sugar electrolytes on the market. All of the electrolytes you need with none of the crap you don't. Can I say crap? I can say crap.

Robb: Dodgy stuff.

Nicki: Dodgy stuff.

Robb: Yep.

Nicki: You can get yours at drinkLMNT.com/robb. The value bundle, buy three boxes, get the fourth box free again. You can get that at drinkLMNT.com/R-O-B-B. And we have three questions for you today. The first one is from Cassie or Casey on liver taste and evolution, "I'm a reader slash listener since 2010. So thanks for the knowledge and laughs for many years, I hope you keep going forever. My question, liver seems to be one of the best foods for us, nutritional density, vitamins, minerals, et cetera, a super food? Any who, I've been wondering why if the above is true, liver tastes so fucking awful to so many people. An amateur thinker like myself would think if it's so great for us, we would have a propensity to desire the taste. But I'm looking to an expert thinker to show me what I'm missing."

Robb: I think this is a wonderful question and I have noodled on this as well. I've been... so I'm a fan of the carnivore diet. I don't think it's the first whistle stop folks should make in dietary change, but for a lot of people, it's super helpful. I've been kind of chagrined watching the schism within the carnivore world where you've got some folks that are like, "Must have nose to tail," and other people are basically like, "No, I'm just going to eat ribeyes." And both groups seemingly doing pretty well. I'm sure that there are some folks that get ground to dust somewhere in there that carnivore isn't the best option for

them, but I've been really intrigued by just how well the folks that don't incorporate any of this other stuff too.

Robb: And then I had Chris Kresser on the podcast two weeks ago, we talked about nutrient density and it was like liver was the tip top of the spear on that for so many different things, and then some shellfish and spleen and kidneys and all these fiddly bits. And I just don't know. I know that in traditional cultures, everything from like menudo and pho, eating the stomach and some of the digestive stuff, some of the internal organs do have a super strong taste to them. Kidneys are way up there, I think they're right behind liver. There is no way in God's green earth that I'm eating that and not thinking that I'm basically doing a piss saute or something like that, so...

Nicki: Do we know if the taste is an issue for more modern people who have been raised with hyper-palatable foods versus hunter gatherers? Do hunter gatherers find it to be not so abhorrent?

Robb: I'm not entirely sure on that. Again, most traditional, what is the... Spanish, anticuchos, you know words like heart, and this is more like chicken, but the heart and gizzard and all that stuff, which I think those are amazing. I think there might be something to that. I had liver and onions as a kid and so I do like liver. I like chicken liver better than beef liver. I like calf liver better than beef liver. So kind of smaller animals seem like just holy smokes that was a bunch of liver. It seems to be not as big of a deal. I don't know, Cassie, it's a really good question. I don't have a great answer on this. It could be a acculturated thing and... because again, when you look around at other kind of non-westernized cultures or just more traditional cultures, usually organ meats do play a pretty important part, especially as the Weston A. Price Folks go crazy over this stuff.

Nicki: Well, and even Italian culture, they'll make pâté and it's a part of their tradition and culture and way of eating. So I think you could probably find some liver in almost all cultures would be my guess. I'm just wondering if we've just been so... our palates have been so distorted growing up with Lucky Charms and Slurpees and all the rest of it.

Robb: Yeah. I mean, because you have folks that eat such processed food that even eating a sweet potato and a steak, they're kind like, "Ah, this is super bland." So it could be that, that could be a thing maybe. But it is interesting. That raises a whole interesting thing too, though, from this evolutionary perspective, are we kind of able to epigenetically bypass sense of nutrition in favor of just sense of calories? So the bowl of Lucky Charms, "Oh my God, it tastes so good."

Nicki: I think that's... Isn't that the whole... isn't happening with everybody being, what do you call it? Overfed, but-

Robb: Undernourished.

Nicki: Undernourished. Yeah.

Robb: Yeah. Yeah. Yeah. But I guess the thing there, maybe what Cassie is alluding to, okay, so you're overfed undernourished, you would think that there would be some sort of biological imperative that when you smelled that liver cooking, you're like, "Oh my God, that's the thing I need." And some people kind of report that. The vegan person, the vegetarian person that hasn't added steak in 10 years and they smell the steak cooking they're like, "I just had to have it," and all that type of stuff. I don't know. I don't know. It's interesting. I don't have a good answer to it. And I like the thinking and there is... there's a whole fascinating food science PhD thesis lurking in that trying to unpack

where and when are organ meats really respected and enjoyed and what are the circumstances where that happens and then what happens culturally and food processing-wise that people started skewing that and going towards more bland flavors, even steak and whatnot? Yeah.

Nicki: Okay. We have a question from Mike on long COVID, "Robb, longtime listener since the paleo solution podcast days and I'm curious to hear your thoughts on long COVID. I'm a 61 year old male, fairly healthy, fit, active, low carb paleo six foot three, 210 pounds with 16% body fat, pre-diabetic, fasting in the low 100s with a 5.8 A1C. I'm not aware of a previous COVID infection, but it now appears that I may have long COVID, AKA post-viral syndrome. I would appreciate a classic Robb Wolf stream of consciousness brain dump." So then he lists all of his general symptoms, which are fatigue that interferes with daily life, symptoms get worse after effort, chest pain, pounding heart, difficulty thinking, brain fog, sleep problems, dizziness, pins and needles, depression, it's everything.

Robb: It's on and on and on.

Nicki: Diarrhea, stomach pain, so it's like the whole litany.

Robb: This is an interesting thing. So Beni Prasad who I really respect, I think he's one of these folks that really understands the COVID situation well, both the vaccine, COVID itself, risk reward scenarios and whatnot. He's skeptical that there's even a thing that we would call long COVID, which I find interesting. And it's been one of the things though that I'm kind of like, "Okay, what's he seeing that I'm not seeing?" I've talked with and followed some of the stuff that Chris Masterjohn has talked about with this and then we've talked internally about this stuff. Early in COVID, I was kind of optimistic in a way because it seemed like there was an opportunity here that this post-infection syndrome thing, it seemed like people have been getting hammered by stuff like this for ages, like Epstein-Barr virus turning into chronic fatigue syndrome.

Robb: And my God, again, I've been dinking around with this stuff. I worked in a health food store in college for my undergrad back in '95 through '98 and chronic fatigue syndrome was the... Alternative medicine kind of acknowledged it and mainstream medicine was like, "It's bullshit. People are making this up," but you clearly had people were sick. My mom fit into this chronic fatigue, fibromyalgia thing, and then eventually over time, it's like, "Well, okay, maybe it's this and maybe it's that and maybe there actually is something going on. Maybe the fact that you don't have a will to live and can't get out of bed and take care of yourself, maybe that's real. It's not just in your head," whatever the fuck that means. I mean, what are you if not what is in your head?

Robb: So interestingly, I was kind of optimistic that maybe this COVID thing, people would start taking post-infection syndrome stuff serious, but then I've got to say it is interesting though some people that I respect, they're kind of like, "I don't know if this is even really a thing." I think that there is something going on here. The two things that seem to be common, and it's worth mentioning people who've had vaccines also report similar type of phenomena post vaccination in addition to things like cardiac issues and whatnot, which also some people with the viral infection experience, these cardiac issues, and that's a whole other kettle of fish.

Robb: But the two things that seem to be going on here, either way seems to be systemic inflammatory response, insulin resistant and kind of a difficult time with mitochondrial function. And this is where I think something like a ketogenic diet and maybe some smart fasting, and if you guys have followed anything I talk about, I'm not a huge fan of

fasting other than some very targeted situations, but this might be a case for doing a 72 hour fast and being ketogenic before going into a 72 hour fast and then eating a ketogenic diet after that, and maybe supplementing with all these mitochondrial cofactors, CoQ10, alpha lipoic acid, N-acetyl cysteine, silymarin milk thistle extract, like just shotgun all these things that help liver function, help mitochondrial function.

Robb: Because when you look at what's going on systemic inflammation, difficulty managing blood glucose levels and maybe malfunctioning mitochondrial activity like fasting, some zone two cardio, those seem like great ways to maybe fix this. It's worth... if this is primarily a mitochondria driven issue, it's worth remembering that the mitochondria, the whole endosymbiotic theory of life is that we had some cells that a small outside cell got into it and that made a eukaryotic cell, which is all kind of modern complex life and that's what it... mitochondria basically a type of bacteria that got inside of a cell and then somehow that got woven into life. One of these things that makes me 99% atheist and 1% agnostic, because it's like, "Damn, that's a lot of work to get done for just spontaneous activity," but like bacteria, you can select mitochondria for better or worse functioning changing the environment that they're in.

Robb: So providing a ketogenic diet, providing the stress of low level exercise, mainly oxidative in nature, low intensity, all of those things create a selection pressure that weeds out poorly performing mitochondria and tends to select for better performing mitochondria. So this seems like all the stuff that would go into fixing this situation and you would have to go very slow, very gradual. Mike is reporting even right now that he's got some blood sugar issues as it is so that could have maybe exacerbated the problem. We have one good friend that has had a really significant challenges with COVID. Young guy and his sleep is shit. Everything else, he exercises, he eats really well, but the dude stays up till three in the morning, not infrequently and has a very disturbed circadian biology.

Robb: But I couldn't figure out what was going on with this guy until I really dug in. I'm like, "Oh my God, his sleep is a train wreck." And that ends up negatively impacting all these metabolic issues. So Mike, this is the stuff that I would think about with this and whether long haul syndrome is real or not, there's clearly something going on with you, and there's clearly something going on with a lot of people. And it's kind of funny whether we're sick or not, not everybody needs to be on a ketogenic diet, but all of the benefits that we get from even some intermittent ketosis, maybe some targeted fasting and certainly some consistent zone two cardio and goosing our good mitochondrial function, there is absolutely no downside to that.

Nicki: Cool. Absolutely. Seems like with that list of symptoms, you'd want to just try anything that you could and just see what outcome you get.

Robb: See what you get out of it. Yeah. And definitely that is not the time to go do CrossFit. That is not the time to dig a deep metabolic hole. The training you do, when you're done, you should be invigorated and feel better. You shouldn't be tired from it. If you are, you went too hard, you did too much. This is maybe the case for getting some sort of a heart rate monitoring system like Morpheus or a WHOOP or one of these things so that you can really get a sense of what a Maffetone heart rate pace is or something like that.

Nicki: Okay. Our final question this week is from Susie on vertical farming, "Hi Robb and Nicki, last week you debunked lab meat. This week, what are your thoughts on vertical farming? I thought this video by Freethink to be excellent," and there's a link here, "Any reason you think this won't work? Looks legit to me as a layperson, but what do I know? Any thoughts? Much appreciated?"

Robb: So we have a link to this video in the show notes and I really encourage folks to check it out. It's slick. This thing is really cool. They open it with basically making the case that this is the way that we'll grow food on Mars. And I'll buy that. On Mars, you have very limited options. There is no outdoor farming on Mars. On our planet though, we do still have options for outdoor farming and some of the upsides that they mentioned with this is that it's super water efficient. It can, in theory, be potentially energy efficient. It uses, in theory, a fraction of the acreage that you would use for regular farming. They mention all the massive amount of land that is allocated to farm land.

Robb: And they, like so many people, make the case that we should just let all that stuff rewild and just grow all of our food in a factory farm kind of gig. Diana and I talked a lot about this. I don't know if the film got much of it, but the book got quite a bit of it. Diana made the point that the food that has grown in these kind of vertically integrated hydroponic setups are almost exclusively what we would call crunchy water. It is greens. Occasionally you get some fruits like strawberries or something like that, but nobody is doing row crops.

Nicki: You're not getting tubers like beets and...

Robb: You're not getting tubers, you're not getting corn, you're not getting wheat. And so it's kind of bullshit on that level. Nobody is producing calories with this. It's just not happening. The startup costs for this operation of this thing is currently about a hundred million dollars to just get this one footprint going. And these folks are really verklempt over it, they're like, "Oh, Moore's law. The costs of all this stuff is going down." And I have no doubt that some of this stuff is improving. One of the really interesting things is that one of the primary energy inputs that they need are the lights, the grow lights, and because of LEDs, there is this fascinating opportunity there where there's the whole electromagnetic spectrum, a big swath of it hits us from the sun and from background radiation from the universe, but only narrow wedges of that spectrum are actually used by plants to grow.

Robb: And so something that folks have done is that they will make these LEDs so that they only produce the wavelength that the plants actually use. So the amount of energy that's needed is dramatically less. And it's definitely cool, it's really neat. But the thing that I keep coming back to is we're just not producing calories. It may be a really cool thing to do so that we've got some nutrient dense vegetables and salads and some places in far Northern climates do this sort of thing. And it's worthwhile for them to just have some hot house tomatoes basically and stuff like that-

Nicki: And have some arugula in December.

Robb: Yeah. Yeah. And it's not necessarily getting trucked around the planet and there might be some economies of scale around that. But it was so interesting where the guy that's running this thing, he said something kind of offhand, he's like "The species, the human race is going to die if we don't fix everything, but we need to fix everything only if it's economically viable." And he's like, "Why does it need to be economically viable? We just need to save the species." And it's kind of like, dude, nothing works unless the economics are there. I mean, it's kind of classic... what'll be interesting is like impossible foods, like beyond burger, how much has this guy and how much has this process benefited from the dumb money that has been dumped into equities and investment and speculating over the last 10 or 15 years. And where are these things going to be in three to five years? I think they're going to be dead on arrival because you're not actually producing calories.

Robb: And here's two things that I do want to touch on really quickly. These folks always go kind of crazy about, "We could rewild all these areas and just turn things back to nature." That sounds great on the one hand, but turning things back to nature. Okay, so are we going to have deer out there and elk and bear and this and that and that's all good. That's fine. Are we going to allow hunting to manage those populations? Are we going to reintroduce wolves like it's been done in areas of Montana and elsewhere and deal with the kind of drama there, mountain land populations, people occasionally getting attacked and killed? There's a lot of stuff that starts going into that and this. Diana's much better educated on the rewilding topic and kind of the boondoggle of that, but what gets missed is that within the regenerative ag space and within the regenerative ag phenomena, there's lots of room for wild animals and it's managed, it's not just left to do its own thing.

Robb: And this is where there's a great book, 1491 and it talks about pre-Columbian contact and makes the case that the Amazon rainforest was effectively a food forest. There was nothing remotely natural about it. Humans had terraformed that area and turned it into a massive food forest and it improved the soil quality and the ubiquity and presence of food producing items. There was nothing natural about it. It went back into kind of a wild state post-initial contact when the population was cut by like 90% and the human population basically disappeared back into the woodwork. But there's this kind of... this is again where people emotionalize things instead of actually understanding what the hell is going on. Rewilding is kind of an interesting concept at first blush, but then when you start asking thornier questions about it doesn't look so good at next review. And then the other point that I would make is that if these indoor growing situations are so wonderful, why is it that many of the marijuana producers in the areas that have good climates to facilitate this, are opting to grow outdoors instead of indoors?

Robb: And it's because the economics win. The sun is free. And once you, if you can button up water sources, which depending on your location, that could end up being a really compelling thing because these vertically integrated situations are really fascinating. They water the plants, the plants pull the water through their stem network, they respire it back into the air, the air is then scrubbed and condensed and that water is recollected and it's like 99% efficient. It's really cool. If you were on a spaceship or on Mars, that's definitely what you would want to do, but it's the difference between that and living on a still habitable biosphere is this huge Delta there. The economics and everything. I think there's some really cool stuff there. I think there could be some great applications, but when this thing is put forward as a solution to global food issues, I think it is the boondoggiest of boondoggles.

Robb: And maybe I'll be completely wrong about that, but we face the same problems where people talk about lab grown meat, "Well, where do you get all the substrate for it? How do you produce all the substrate to grow the meat, to get the amino acids, the minerals and all the rest of that to dump into the vat to be able to grow the meat?" And there's just kind of a reality that an open biosphere that grows food naturally, even if it's managed, is pretty goddamn efficient because we get all these other kind of benefits to it. So I think it's cool stuff. It's kind of a hat tip to the engineering and innovation of these folks. There may be some really targeted applications where I think it's great and may have maybe a huge benefit.

Robb: If we ever do get off this planet and start setting up shop elsewhere, if we don't have an intact biosphere to land on and we don't have a manageable atmosphere, then we're going to grow shit like this, for sure. But in lieu of that, there's just a massive difference between taking advantage of the natural world, the sun, the non-equilibrium thermodynamics of trying to optimize the energy capture of a vibrant ecosystem on our

planet that mitigates soil erosion and fosters ecosystem diversity outside versus trying to pull all this stuff indoors and then just act as if nature is just going to go and do its own thing.

Nicki: Good question, Susie.

Robb: Yeah.

Nicki: Okay. Any other thoughts before we wrap this episode?

Robb: Oh my God. I mean, I solved all the world's problems in this thing, so yeah.

Nicki: All of them. All of them. Well, thank you guys for tuning in again to another episode of The Healthy Rebellion Radio. Be sure to check out our show's sponsor and grab some electrolytes at drinkLMNT.com/robb, that's drink L-M-N-T.com/-R-O-B-B and we hope you all have a fabulous weekend and we'll see you next week.

Robb: Bye everybody.