

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 1 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.

Robb: Welcome back.

Nicki: Hello, everybody. This is episode 145 of Healthy Rebellion Radio. Thank you for giving me the mouse. I like to be in charge here when we run these things. What's new, hubs?

Robb: We were trying to figure out something noteworthy to-

Nicki: To talk about at the beginning-

Robb: To talk about at the beginning, but-

Nicki: Falling flat.

Robb: Yep, it's almost spring.

Nicki: It's almost spring. Oh, I know what we can share. So Zoe, our oldest, is super enamored with all things dog sledding. She's been reading a ton of books and she watches all kinds of videos and she's really-

Robb: Really into it.

Nicki: Really into it, loves it, and her dog, Grizz, who will be a year old the day this episode releases March 10th, she got a harness for him for Christmas. And so, she's been working with him, slowly building up his ability to pull, just a little normal, toboggan kind of snow sled, and he can now pull both her... One at a time, her and Sagan on the sled, and it's fun to watch.

Robb: Pretty impressively.

Nicki: And so, she's all fired up to do a DIY dog sled. So, we went to the thrift store a couple days ago and grabbed a pair of old skis, and now there's a couple of

different ways to go about it that people have done it. So, we're evaluating the options, but she wants to build a dog sled, which is pretty darn cool.

Robb: She's passionate about it, and Nicki and I have been talking about different homeschool stuff and what we're up to with it and everything, and I still am of the opinion that a really strong math base, outstanding reading comprehension-

Nicki: Critical thinking.

Robb: Spelling, and then critical thinking, which there's never not a situation where we can't pause and well, how are people thinking about this versus that? We are listening to The Witch Trials of J.K. Rolling, which is a free press special podcast piece and-

Nicki: It's not necessarily child-friendly. We started listening to it with them, and definitely there are some things that pop up that I'm like, "Okay, this is a little bit obscene for our children's ages," but we listen and then we talk about, what did you get out of that? And, some of the words that are being used, they don't necessarily understand, they're just listening big picture, but-

Robb: She has been assailed from people who are essentially totalitarian in their approach in that she's been assailed from people on the left side of the political spectrum and the right side of the political spectrum. And so circling back to the dog sled and homeschooling, and I think that there's some basic things that all of us do well to have some solid steeping in. And then from there, passion really wins the day, and we're trying to weave in a little bit of science and a little bit of history and different things around both of the girls' passions because I think back to... I have a very vague notion of world history. Clearly, I have an interest, the whole Paleolithic, Neolithic transition, so I've got a little bit of understanding around the archeology with that, but then the Fertile Crescent, Christianity, Europe, Dark Ages, the Mayflower Compact, it's just a hodgepodge.

I have some really vague notions about all that stuff because I wasn't really that into it as a kid, and it'll be interesting, I do think that... I don't know, some American history, like the Constitution, freedom, maybe I will disproportionately put that out there, but even then, I fully understand that if the kid just doesn't care... There are some kids that will rise to the occasion or you can put them in situations in which they'll get the A, but we were having a conversation the other day with the girls about, do the best job you can always.

That's always the goal, but they hear from friends and they hear from their cousins and stuff like that, "Oh, I got an A in this class. I got to B in this class." So they'll ask us, "I just did this paper, did I get an A?" And technically yeah, if they were in a standard school program, like the 90% and up is typically an A and all

that, unless there's some sort of interesting curve, but understanding that the world doesn't give you A's, and B's, and C's, it gives you, did you get it done and did you get it done well enough to keep your job, move the project forward, get hired, not get fired? There's all these really intangible things, and I'm not sure how we got to that other than-

Nicki: We were just talking about the dog sled and her passion there, and it'll be interesting to see what our kids end up wanting to do professionally or career-wise. We are definitely not going to super push the college route. If whatever they want to do requires a college degree, then by all means we are going to help them do that to whatever degree we can, but if they don't, then that's fine with us too. We listen to a lot of Mygrow, as you all know, and the girls also, and I think there's a lot of wonderful careers, high paying jobs that can be done that don't require college education. So, it'll be interesting to see what paths they end up taking.

Robb: For sure. See, we pulled something together.

Nicki: We pulled something together, I know. I asked him before we pushed record, I'm like, "I don't know what we should talk about at the beginning because usually we chit-chat about something," and he's like, "I don't know. We'll come up with something." Robb likes to shoot from the hip.

Robb: But, we still hit the bullseye.

Nicki: Let's see, let's move on here. We did have a couple of listener comments in response to last week's question that Don asked about her friend who was having some kidney function issues and was wondering about creatine-

Robb: Creatinine-

Nicki: Her use of creatine affecting her creatinine levels.

Robb: Yeah.

Nicki: So, we had two people write in. One, this is from William, and I'm just going to read a couple of their responses because they're pretty solid. "Hey, Robb and Nicki, I love your podcast and point of view. Thank you so much for the information and entertainment you provide. I see sincerely look forward to all your episodes and hope I can maybe help a little and give back. I just listened to episode 144 about the part with the low kidney function and respect to creatine and working out in a high protein diet. I have been dealing with the exact same thing for years. A couple of things that I learned along the way that I wanted to pass on to help. One is the GFR is just an equation that uses either creatinine or

cysteine waste product to estimate kidney function. Baked into this equation, most labs I've used use a canned body mass of 1.73 meters..." Is that meters?

Robb: Mm-hmm.

Nicki: "Squared for the equation, and may or may not even include age when I equated for my actual body mass, which is 27% greater than the canned, and age, and sex, my results are a lot better. Here is a link to it for an EGFR calculator where you can put in your creatinine number with your actual mass, et cetera, and get a more realistic result." This will be in the show notes, so Don and whoever else is listening, if you want to come and use this calculator, you'll be able to click directly from the show notes on robbwolf.com and then he links to the calculator. There's a lot of good information on that site about these tests that will help further.

"The other thing you can do is have your EGFR done using cystatin C-levels instead of creatinine. Whenever I have the labs done using creatinine, my EGFR comes back low. When I have EGFR done using cystatin C, my levels are great. This negates the need to have to reduce protein, creatinine, working out, et cetera, at least in my experience," so that was-

Robb: Awesome.

Nicki: Really great input. We also had another listener write in. This is from Bo. He says, "I happen to be a urologist. So while I am not a nephrologist, I obviously deal with the kidney a lot. I am the plumber of the urinary system. There is a question about the creatinine levels and working out, et cetera, and one additional thought I had is related to my understanding of what the literature has shown in people with legit renal dysfunction. It used to be that if people had a urinalysis that showed protein in the urine, it was felt to be needed to replace that protein with a higher protein diet. This ended up resulting in worse outcomes for those people. That is the basis of the lower protein recommendations for people with kidney disease."

"Interestingly, when they get on dialysis, that reverses to a high protein diet. I think the rationale there is primarily that the kidneys are basically already shot, so it doesn't matter if they do worse from a functional standpoint, but there's benefit to the protein in general. More importantly is the definition of kidneys dysfunction. Creatinine levels are the primary surrogate and marker for this, but as you know, they're incredibly flawed. Creatinine is a good test in a steady state fashion when someone can be tracked over time without other changes, but in times of stress, dehydration, sickness changes in exercise routine, et cetera, this number is not very accurate. A 24-hour urine collection with a nephrologist can easily answer the questions about full kidney function, ability or an inulin blood

test should be able to do the same thing. It doesn't have the same secretion and reabsorption parameters of creatinine and therefore does not have the same inaccuracies."

Robb: Nice.

Nicki: So, two great comments there. Thank you both William and Bo for sharing those, and Don, I hope that is helpful for your friend and anybody else who's listening and has something similar going on. Let's see here, hubs, news topic today.

Robb: Can you click that tab?

Nicki: This one?

Robb: Yeah, or wait, maybe I opened up... The one next to that, to the right.

Nicki: This?

Robb: There we go. It's a Fast Company article that Diana Rogers shot to me, and she was gloating a bit because we've been... Well, so the title is The Vertical Farming Bubble is Finally Popping, and then the lead in, "Climate change might make growing produce indoors a necessity, but despite taking in more than \$1 billion in venture capital investment, most companies in the industry seem to be withering, unable to turn a profit on lettuce." And, this is another one of these things that was just thrown out amidst the... Well, just, I guess general insanity, but this notion... It's actually a pretty good article. Although the intro, "Climate change might make growing produce indoors necessary," if climate change gets so bad that we need to grow shit indoors, we're basically on Mars or the moon. Shit has gone really, really sideways, but this has been one of these things dangled out there as this solution that is not remotely a solution to anything. It's not cleaner, it's not greener, it doesn't actually produce food.

Nicki: You're saying lettuce isn't food?

Robb: You could eat a lot of fucking lettuce and not really get yourself too far other than a very tight orbit around your commode and nothing beyond that. The article is good in that it paints this picture that the tech field, so these companies have just had ungodly amounts of money poured into it. And, what they're trying to do is grow vertical indoor farming, but literally the stuff that they grow is lettuce and greens, occasionally something like tomatoes, there are no commodity crops. There's no soybeans, there's no corn, there's no wheat because it doesn't work this way.

Nicki: Nothing with any measure of nutrient density-

Robb: You can't feed people this stuff. Now, if you live in a far northern climate, like I know Iceland actually has invested in this stuff, and you just want some fresh produce, great, but hanging this stuff out there as a climate change solution and a solution to hunger, which is a lot of what these people have done, is fucking a lie. And this is, again, one of these things that if we're not operating with good information, then we're going to make horrible decisions. The one nice thing about this has been all VC money, stupid VC money coming out of tech, and tech just can't not have a hard-on for tech. They will not invest in farms, but they will invest in these-

Nicki: Bill Gates invests in farms. He buys the land under them, I guess.

Robb: He buys the land, but they're not getting in and trying to spin up Polyface Farms and make it a more broad reaching concept or anything like that. So, these companies have got in and invested huge amount of money on AI-driven robotics to plant the seeds and water the plants, and there's all this crazy infrastructure and everything, and there may end up being some benefit to this type of infrastructure, but in Sacred Cow, I pointed out that not only was this a boondoggle, it's not just... Diana made the term, like they're making crunchy water, that's all it is, this lettuce, but I pointed out that in the areas where people have been in a scenario that marijuana production has been legalized, they move it outdoors for the most part if the weather is amenable at all because it's fractionally the cost because the sun is free and there's all these other externalities-

Nicki: Rain is free.

Robb: Relatively, and even if you have to water it, there are absolutely cases to be made where indoor hydroponic farming can be beneficial for certain types of things. But by and large, even the bulk of the marijuana industry has moved outdoors when and where they can, when you're not hiding from the law and whatnot. And, there's even cool developments like having LED lights that only produce the specific spectrum of light that plants used during the photosynthetic process, so it should make it all more efficient. All that stuff's great. It's really cool, and we might use it on Mars when that is our only solution for producing some type of food, but I don't know, it's heartening on the one hand to see this, and the only reason why this bubble popped is because of the economic slowdown and that VC money has-

Nicki: It's being a little more judicious with where it's going.

Robb: Putting this money, so anyway, it's a good one to kick around and it's just one of these, excuse me, when we're really thinking about a globally networked, decentralized food system, stuff like this gets held up all the time, and the

smartest people in the room, all these tech people with 160 IQs that are super fucking smart, they get enamored by this stuff. They think that tech is going to be the solution to everything in all of our woes and I'm a huge technophile. I love advancement and everything, but the reality is that our planet and our ecosystem is really a remarkably fine-tuned, well-running machine. And, using drone technology to look at acreage of grasses to figure out when and where to put grazing animals, that makes a lot of sense. I could see doing things like that. I think that there will be technology that comes in and helps to inform what we're doing here, but we're just not going to vertically farm our way out of climate change or food insecurity or anything else like that.

And the funny thing, again, is with the cultured meat, the medium that is put into that stuff is made out of industrial crop products, grains, legumes that get processed and the protein, carbohydrates, fats, other nutrients are extracted out and then put into a medium, and they also do a lot of seaweed. And, then that's a medium mixture that then cells are inoculated into that you need to make sure bacteria and fungi don't get into and sully the process. You have to keep it heated and cooled and lights and all the rest of it. It's a very inefficient thing, and again, if you were on a multi-generational spaceship and you had no other options, if you're on Mars where you have no other options, then okay, I get some of that stuff. This is some of what that's going to look like because you can't lean into a stable ecosystem, but we're not there yet fortunately.

Nicki: The Healthy Rebellion Radio is sponsored by our salty AF electrolyte company LMNT. Need more energy? Tired of the afternoon slump? Want an extra little performance boost, be that physical or cognitive performance? One of the coolest things about LMNT is that people actually feel a difference when they use it. Their energy levels improve noticeably, muscle cramps disappear, performance improves, and so if you're eating low carb or keto, if you're training hard, if you work a physically demanding job or suffer from muscle cramps, you'll want to give LMNT a try and feel that difference for yourself. You can grab yours at drinklmnt.com/robb. That's drink L-M-N-T.com/R-O-B-B, and remember, friends don't let friends go about their day without adequate electrolytes. So, be sure to spread the love and the salt to friends and family. All right, are you ready for questions?

Robb: I'm ready.

Nicki: You're ready, this first one is from Mikael on a paper review that's claiming that increased protein consumption is linked to sarcopenia. "Hi, Robb and Nicki, I really appreciate your podcast. I recently came across a study conducted in the UK that has really stumped me and was wondering whether you might be able to have a look at it and help shed some light on it. For ease of reference, here's the link. Keep up the good work."

- Robb: It's an interesting paper in... That is the-
- Nicki: This first one.
- Robb: ... Link, right? A higher dietary protein intake is associated with sarcopenia and older British twins. Twin studies are always great because you have virtual genetically identical individuals, and so if there's any delta in their diet or exercise or lifestyle that seems to manifest in some sort of a health or disease process, then that can be compelling.
- Nicki: Like the famous image of, is it Ato and-
- Robb: Evald.
- Nicki: Evald, the sprinter versus-
- Robb: Shot putter.
- Nicki: Endurance athlete, I remember that.
- Robb: He was a runner versus the shot putter, sprinter, and the one guy looked pretty big and jacked and the other guy was kind of scrawny.
- Nicki: Wasting away.
- Robb: So, these things are really valuable, but when you dig into this, what we had is still a food recollection questionnaire that was put out to these folks. So, we're not really that clear about what these folks are exactly eating. When you read through the whole paper, it's interesting, the stuff that needs to be included in research these days. There was hand wringing around protein intake as it relates to climate change, which I think listeners understand our perspective on that, and that maybe animal husbandry isn't actually the primary driver of climate change. There's a lot of moving pieces to this paper. It's pretty thorough and it is confusing. There's other pieces in this paper, and it relates back to other papers that have looked at this question and found largely contradictory findings, which historically when we have seen questions like this posed, higher protein intake typically tracks with better muscle mass maintenance and lean body mass maintenance throughout age. Some of the more recent papers, though, are fascinating in that it tracks favorably protein intake with muscle mass maintenance, but only if it's plant-based proteins.
- Nicki: Are you wondering, are there any conflicts of interest declared at the bottom of this paper? I'm wondering-

- Robb: I didn't dig super deep into that. I didn't dig super deep into the funding and whatnot, but this is one of these things-
- Nicki: Whenever findings shift so dramatically from here's the findings were consistently that increased protein leads to muscle mass maintenance or whatever, and then all of a sudden we're seeing a deviation from that, it makes you wonder what's going on.
- Robb: So one thing, and we've seen this around COVID topics, even folks that are raising questions around say like the lab leak hypothesis or potential problems with the vaccines and things like that, they have to do a lot of exculpatory clause stuff. Basically a bunch of cover your ass about, yes, we acknowledge climate change. Yes, we acknowledge that plant-based diets are healthier. There's a lot of stuff that goes into that, and Nicki-
- Nicki: Well, it's funded by the Wellcome Trust, and I remember that from something else as being... It's a red flag for me. We fund curiosity-driven research, and we're taking on three of the biggest health challenges facing humanity, climate change, infectious disease, and mental health. So, I can't remember where I saw their name before. They're big investors in something else that was like... I don't know, it's a red flag, but I'll have to dig into that more because I don't remember off the top of my head, but that is the primary funder of this paper.
- Robb: So...
- Nicki: Sorry I derailed you.
- Robb: No, you didn't. This is great stuff. I'm thinking 50 different things here. The best that I would throw out here is that maybe there's a signal in which people who had other health issues that induce them to eat more protein, that that's what's happening. That's the most generous thing that I could have here. And so it's actually, if people had some sort of a chronic wasting condition or their lifestyle was such that it was not amenable to maintaining muscle mass and so heightened sarcopenia, and oh by the way, they just happened to also eat more protein because instinctually they were just trying to compensate for that, and that's being really generous. I'm trying to put on my good scientist hat and trying to look at every angle of this thing. The thing about it though is that aside from the funding, which we'll circle back to in a second, this literally flies in the face of everything that we see.
- Animal studies, human studies on and on and on, we tend to see better lean body mass indices with increased protein intake. And to some degree, you don't really see a top end to that. Some of the protein overfeeding studies, the only net result was that people gained lean body mass. Now, this isn't infinite, you

don't become a professional bodybuilder on this thing, but where overfeeding of carbs, overfeeding of fat people gain body fat.

Overfeeding of protein people tended to get leaner and gain muscle mass, and this is in what I would consider to be more like gold standard studies where it's metabolic and we really do know what they're being fed and what their activity level is and all that type of stuff. Then when you add in, and I am glad that you did this other dive, one of the stated goals around this whole climate change topic is that we need to reduce people's protein intake because it's bad for health, it's bad for the environment, and this extends even to some degree in the plant-based proteins because they just want people eating less all the way around, which is okay as far as that goes. You're going to have to-

Nicki: I don't know how to do that.

Robb: There we go.

Nicki: Thanks.

Robb: But, this is one of the critiques of the EAT-Lancet position around like the climate change dietary recommendations is that when you reduce folks' protein intake, they will tend to overeat whatever else it is that they have access to, this protein leverage hypothesis. So, I think that there's probably some hinky business going on here because of the funding and because of the orientation that people almost implicitly have to be able to get funding and to be in this space at this point. The very best thing that I could attribute to this is maybe they found a signal where some other situation is again, driving overt sarcopenia in these very disconnected UK twins, and that somehow protein intake is being ramped up to try to deal with that, but I would argue that it's probably more likely that this is just garbage science driving this climate change agenda.

Nicki: Eat less meat. Our next question is from Josh on Hashimoto's and elevated liver enzymes. "Hey, Robb and Nicki, I have been eating paleo-ish since about 2009. I was diagnosed with Hashimoto's seven years ago, and I've been seeing a functional medicine practitioner since then and have had good luck keeping all things thyroid related where they should be. The one issue that has plagued me is elevated liver enzyme levels ALT, AST, and GTT for years. I do not have any symptoms, pain, et cetera, that I know of related to elevated liver enzymes. My doc is concerned that I may have liver issues down the road. I don't regularly take any other over-the-counter meds that could be causing this either. The best success I had was when I greatly reduced my exercise levels. The theory was that the exercise causes muscle damage that in turn overtaxed my liver."

"Over the past six months, I have increased my exercise greatly. Every afternoon I run three miles with the dog, except on Saturdays when I hit the trails to run with friends for usually five to 10 miles. I also do kettlebells two times a week, club swinging two times a week, and two days of balance and mobility training in the mornings. The kettlebells and clubs are not intense, not CrossFit type metcons, just the basics. I recently had blood work done, and no surprise, my liver enzymes were even higher than normal. Do you have any other ideas of what could be causing this? Anything else I could try or should I drop down to a lower activity level and have labs run again after a few months to see if the pattern holds?

Robb: A couple of thoughts on this. One thing that could possibly be tinkered with is adding in some liver support in the form of silymarin, which is a milk thistle extract, alpha-lipoic acid, make sure that you've got adequate selenium. Maybe even if you tolerate whey protein, making some amount of your protein that you consume come from whey protein so that we make sure that we have really robust glutathione production. You can also find certain varieties of glutathione which claim and appeared to actually be able to make it through the gut barrier intact and actually offer some antioxidant protection there.

So, there are some things that can be done for liver support that could maybe help on the front end, but the thing that I'm wondering about here, we know that exercise is so incredibly beneficial on so many different levels. What are we giving up here by reducing exercise and is this a situation in which exercise is literally causing liver damage or is this just a scenario in which your numbers are just outside of the norm here? Is there actual damage going on, or are the numbers that are normal for you, just again, a little bit outside the norm? I don't know if a biopsy would be the way to go. A liver biopsy is a gnarly procedure, so that's a pretty big deal, but if you can look at other means of monitoring in this process, that makes sense, but God, I'm really hesitant to say, "Oh, well, don't exercise because mental health and all cardiovascular fitness and—"

Nicki: Three miles, it's not like he's logging 20 miles a day and running 100-mile races and doing something... It seems pretty-

Robb: Very reasonable.

Nicki: For a runner, it seems very reasonable.

Robb: So, those are my thoughts around that, I guess, the potential of supplementing liver function with things like alpha-lipoic acid, silymarin extract, making sure that you get adequate selenium and then you possibly the whey protein because of the glutathione production that you get out of that. And then beyond that, I just question whether we actually have liver damage that's occurring here versus

just the liver enzymes being out of parameters for what we would call normal, but it may be completely appropriate for you. And, we'd love to hear follow up on this. I'm legit curious about this.

Nicki: Yep. Thanks, Josh. Last question, or maybe second to last question. Did you read about this one? Did you want to answer this one?

Robb: Let's tackle this one instead. No, let's do that one instead of the other one.

Nicki: You do?

Robb: Yeah.

Nicki: All right, this last question then for this week is from John. He says, "Hi, Robb. I had a conversation with someone about LMNT, and I was curious, as I'm looking to add LMNT to my low-carb diet potentially, but a curious question was brought up by this other person. I'm sure it's easily explained, but what is the difference between the potassium chloride in LMNT versus how it's used in lethal injections? Is it simply a case of the dose makes the poison? Thanks for your help. I'm sure this concern brought up by my friend holds no true weight."

Robb: So if you were mixing up and injecting LMNT, that might be a problem. I did a little poking around. One, the difference in the potassium chloride, there isn't any. They're the same molecules used either way, but when it's used in a lethal injection scenario, it's really not a massive amount. It's about 150 milligrams per kilogram. If you had a 75 kilogram person, then you're talking about a bolus of say like almost 10 grams of potassium that is applied to the vasculature all at once, boom. It basically causes the heart to not be able to contract anymore, and that that's it. It is a big dose. If you took seven grams of potassium chloride or getting the potassium orally, that might cause problems for some people at a cardiovascular level, but it's for sure going to cause problems at a GI level. So a big part of this story, it is the dose. We only have 200 milligrams of potassium in LMNT, so even if you take multiple of them a day-

Nicki: There's potassium chloride in a lot of other foods too.

Robb: There's potassium chloride in a lot of other foods. When people are told to go on a low sodium diet, they're oftentimes counseled to buy no salt, which is straight potassium chloride, and there's dosing parameters around that. So it is the same stuff, but it's applied in a very different way. It's a rather large bolus applied venously all at once. And so, the kinetics are shockingly different versus consuming this stuff orally.

Nicki: Yes, we don't make-

Robb: But, good question.

Nicki: We don't make any recommendations about injecting it.

Robb: Nope, I would say we counsel against that.

Nicki: We do. Maybe we need to be more active in that counseling. I think that's a wrap for this episode. Any closing thoughts on your side?

Robb: I don't think so.

Nicki: You don't think so? Okay, well, folks, thanks for tuning in yet again to another episode of the Healthy Rebellion Radio. Send us your questions. You can do that via the contact form on robbwolf.com. Again, all of the show notes are also on robbwolf.com on each episode's page. Please share this episode if you so choose. We would appreciate it, and thanks for joining us. Remember to check out our show sponsor LMNT for all of your electrolyte needs. You can grab those at drinklmnt.com/robb. That's drink L-M-N-T.com/R-O-B-B, and we'll catch you all next week.

Robb: Bye, everybody.