

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.

Nicki: Warning, when Rob 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: Howdy folks. Welcome back to another Healthy Rebellion Radio. Wife, how are you doing?

Nicki: This is the not so healthy host day.

Robb: Care to elaborate on that?

Nicki: Well, we're both a little gimped up. In jujitsu yesterday, after one of my rolls in open mat, I felt like my back was slightly glassy, like I tweaked it just a teeny bit. Then we came home and I was just sweeping. I bent down with the dust pan and I could hardly stand back up again. So yeah, I'm hobbling.

Robb: Nicki, very rarely every once in a while, you'll get a little back tweak from whatever. I'm much more prone to that and I've been tinkering with sleeping on the floor, which seems great for my back, but is terrible for my sleep because I'm just skinny enough and bony enough that it hurts. So I'm doing a gator roll all night, and we have a very nice bed. You lay down in it, oh man it feels good. It hurts my back.

Robb: We've had a lot of house guests, which has been awesome, but we also have completely neglected our mobility. We tend to sit a lot. Our sleep has been off, so these are the many, many woes of the-

Nicki: We almost did this podcast, or we attempted to record this podcast, kneeling.

Robb: Doing the kneeling alter boy.

Nicki: We have a standing desk, so we can lower it all the way down and kneel. But after about 10 minutes of sitting like that, it was-

Robb: Your feet falling asleep.

Nicki: ... very uncomfortable. So we are in chairs and we'll attempt to get through this.

Robb: We'll get through it.

Nicki: We will.

Robb: The funny thing will be when we press stop and just stand up.

Nicki: When we go to stand up.

Robb: We've never had both of our backs go out at the same time. We've been close a time or two.

Nicki: We're going to be real aggressive after this because we have Matt Thornton, founder and president of SPG coming to Kalispell this weekend, Saturday and Sunday, for a seminar which we've been looking forward to. So I'm really hoping we can participate and aren't just on the sidelines watching.

Robb: I have a bunch of Valium somewhere, so maybe we'll just be drugged. Drugjitsu.

Nicki: Mm-hmm (affirmative).

Robb: So you've got some ...

Nicki: Well, I was just going to share. We've talked before about kids using phones and whatnot, so we've kind of ... as we've shared, the girls really enjoy using them, but we've been really not stoked with how their behavior changes after playing video games. So we've kind of put the kibosh on that. Then I don't know how they found this TV show because, usually if they watch a show, it's Secrets of the Zoo or the Incredible Dr. Poll, which they learn all about abscesses and delivering calfs. It's very educational.

Robb: The cycle of life.

Nicki: The cycle of life. Lots of death happens too. But they found this ... It must have been one of their friends in Texas turned them on, maybe Megan.

Robb: So the girls are into these Briar horses.

Nicki: Briar horses and also Sheik little animal figurines. They can be horses. There's lots of horses, tigers, wolves, bears, every animal under the sun basically.

Robb: So that's a thing. Then I think that the way that it came up is that one of the shows they wanted to watch a nature show on lynx for Sagan. They saw something that was basically talking about infinity Briars, which is this young woman who has these shows.

Nicki: It's a YouTube channel with all of these videos where she has her Briar horses and she's filming herself enacting these scenes with her different horses, and she's got different voices. Some Russian voices ... She changes her voice with the characters of the different horses. I don't know how many videos she has.

Robb: Lots.

Nicki: Hundreds, lots.

Robb: Lots.

Nicki: So the girls like watching this and we're like, oh my God, gouge my eyes out. It's pretty painful to watch this stuff. But they've tried making their own, so now they're in this really fascinating kick that started with just kind of filming themselves acting out little scenes with their animals, and they try to keep their hand out of the-

Robb: Frame.

Nicki: ... frame. Now, their cousin was here last week and they spent all day sewing little costumes for their horses and wolves.

Robb: Now they're making armor for them.

Nicki: Now they're making armor because they want to make a video where there's a battle scene. So they've got this ... We found on the clearance rack in Michaels, this faux leather looking vinyl fabric that looks-

Robb: So we fashioned a pretty legit battle helmet for her war wolf.

Nicki: With little wires wrapping around the ankle shin.

Robb: Gauntlet.

Nicki: Yeah. So anyway, pretty cool. The cool thing is they'll do this and they'll spend some time. They'll spend hours crafting these costumes, and the little outfits and saddle pads, and saddles and whatnot, and then they'll film their little scenes. They aren't shit bags afterwards.

Robb: They're not little shit bags afterwards. It's a really profound difference. The thing I'm nervous of is when they're like, hey I want to share this with the world.

Nicki: Yeah, no. We're not going there yet. But it's super cute. Then the funny thing is, because they've seen this young gal do these videos, they've taken on, "This is Sagan with Tiger Films, and today we're going to ..." the voice, the inflection, it's pretty cute. So anyway, I don't know.

Robb: I think it's helpful because you and I have had a little internal back and forth on this where I think you have been more of the just no-

Nicki: No device, yeah.

Robb: No device. I pointed out that, when I was a kid, we had these cassette tape recorders. Before you had the two cassettes in one thing where you could-

Nicki: Record from one tape to the other.

Robb: ... take one to the other and you could do some editing and stuff like that. We would literally take one playing it into the microphone of another and dub music that way and do different things. We spent hours doing that, particularly when the weather was kind of shitty. I think, when you're in a process of creating something, it's a really different story and kind of calculus versus just cracking out on-

Nicki: Passively playing something.

Robb: ... playing a video game or for sure social media sometimes. So this is the ever evolving story of us and trying to navigate.

Nicki: Yeah. Then it's like, "Hey mom, want to watch it?" The number one question is how long is this one.

Robb: Except for once in a while, they get 10 minute films and you're like, oh.

Nicki: Yeah. But it's pretty cute. Okay, enough of that. Some stuff happening inside the Healthy Rebellion community. We are starting another round of rebel strong, the strength program with basis in New York. It's starting Monday, July 12th. This program was a huge hit last summer, and Sara and Grayson Strange have decided and offered to come back and do that again with us this summer, basically taking us through another cycle.

Nicki: So if you're interested in this program, along with all of our resets and events are free with your membership to the Healthy Rebellion. So that will be kicking off on Monday. I'm really hoping my back is in shape to participate. I was looking forward to that. I will definitely do what I can.

Robb: Again, drugs, drugs, drugs.

Nicki: Okay, anything else you wanted to talk about in the intro?

Robb: I don't think so.

Nicki: Okay. Lots of crazy stuff happening in the world, but we don't need to go into that right now.

Robb: Yeah. Just trying to ... I rock and make mewling noises and go to my happy place, so I think we're good on that.

Nicki: Okay. What do you have for our news topic today?

Robb: So this is kind of meta. There's a general website called Munga Bay, which has a piece when it comes to carbon capture, tree invasions can do more harm than good. They are referencing a recently published paper from the Frontiers Ecology and the Environment that asks the question, should tree invasions be used in treeless ecosystems to mitigate climate change. It basically ... it's interesting. Who is it? Shopify.

Robb: I've ordered some stuff, so the Shopify app, they suggested I download it because I can track things and Shopify plants trees to mitigate climate change and everything. So let me back up a little bit and just pull some of the bullet points from this paper. So the paper goes pretty deep in this stuff. This newsy piece is very accessible for anybody, but the point to this is that many of the knee jerk reactions that folks do around complex problems are wrong. I'm not saying planting trees is a bad idea, but it's put forward as this all good all the time.

Robb: What we're finding is ... again, I'll read from this-

Nicki: You're saying that there's nuance involved with this stuff?

Robb: There's actually nuance and we might want to do some things in some places and other things in other places. So trees are a logical solution to climate change, but allowing or encouraging trees to move into areas where they don't typically grow, such as tundras and grasslands, can actually do more harm than good. Invasive trees may capture less carbon in the treeless ecosystem they overrun due to soil disturbance, increased risk of fires and changes in light absorption.

Robb: A recent review paper shows these results have implications for policies and initiatives, particularly those in places where carbon credits have been used to discourage the removal of invasive non native trees. Man, so-

Nicki: I think this falls under the unintended consequences category.

Robb: Absolutely, absolutely. We're in this world now where of course I would suggest that trees aren't good because I'm white and male and patriarchy, and privileged. Just this laundry list of stuff. To shut down discussion around ... and this has been my point for ages, which is that if we're going to tackle this thing, thing being climate change, but we're going to do it in a way where we don't unintentionally make things worse, we need to be really smart about it and we need to have really detailed conversations and lots and lots of nuance. It's very, very difficult to do that.

Robb: The climate change topic, I would say, has almost taken a little bit of a backseat to the COVID topic with regards to getting canceled, shadow banned, your stuff labeled as misinformation.

Nicki: Misinformation.

Robb: Or what have you. This is one of those pieces where, on the surface of it, it just seems like such a natural thing. Gosh, each time I shop with Shopify, they plant a tree and that's great. There probably are great elements to that. But I'm reading the book from David Coonin, I believe is his name. He's the former Obama Administration energy czar. He's a physicist and he was tasked with producing a report around climate change. When he really got in and looked at what the science said versus what the media claims were, it was as if they were on two different planets.

Robb: What he was very afraid of, and he acknowledged in the forward of this book, "I've never seen as many exculpatory clauses like I know this is going to be the end of my career, I know I will be assailed on social media, I know I will be labeled a right wing extremist."

Nicki: I think he also-

Robb: Go ahead.

Nicki: I think he also said that his daughter is glad that she was recently married and changed her name.

Robb: Her name changed. She actually said that. So this is the world we live in now where the children of people who are activists, trying to do good. Maybe he's totally wrong. Maybe this highly decorated physicist has this thing wrong or has parts of it wrong, as anybody would be, but he was so aware of and fearful of the blow back that's going to come about from just questioning any of the narrative, and he doesn't say that climate change isn't happening. He doesn't say that human beings aren't contributors to this thing. But there's actually a mountain of nuance within this whole story.

Robb: One of the interesting things is that grasslands in general have a lower heat footprint, a higher albedo. They reflect more heat back into space than woodlands. This isn't to say that you want to go cut down all the trees and try to convert riparian habitat into grasslands, but grasslands don't-

Nicki: They serve their own purpose.

Robb: They serve purpose.

Nicki: Who knows, maybe Shopify is planting trees only-

Robb: I'm not beating up on Shopify here.

Nicki: Right, right. But let's hope, if I'm reading this article correctly, you don't want to try to start planting trees in areas like tundras and grasslands. You plant them where trees already grow natively.

Robb: Right.

Nicki: Ideally the same species that grow there.

Robb: Right.

Nicki: Then maybe it's a net win. But if you're trying to plant trees in areas where it's a different ecosystem-

Robb: Right, but the flip side of this, and this is something that just can't be ignored, if grasslands are an integral part to a healthy planet, if they sequester carbon, which they can if they're properly managed, if they increase the albedo of an area which is basically the reflectiveness of the energy going back into space instead of getting absorbed at the ground and converted into heat, which does effect the local weather and the climate more globally. If you need a healthy grassland, what do you need to go with that?

Nicki: Some cows.

Robb: Shit that eats grass.

Nicki: Yeah.

Robb: This is where we get into this really interesting-

Nicki: Can't we just plant a bunch of peas for pea protein?

Robb: We might and we'll be super screwed. But anyway, it's a very accessible piece. We've got links to it in the show notes. I think most folks who listen to the podcast at this point are probably bought in with at least the possibility that there's a lot going on here. I think a fair number of the listeners have watched Sacred Cow the film, or read the book or something like that. They've listened to us talk about this stuff on the various podcasts. But if you have someone who's really concerned about climate change and these different pieces, this is an important angle to look at this.

Robb: In this piece, or at least in the newsy piece, they don't explicitly talk about the importance of grazing animals to have healthy grasslands, but this is basic ecology and I still haven't read the primary paper. So maybe they do elude to that in the primary paper, but it's kind of an if A then B proposition. You don't get healthy grasslands without appropriate interface of grazing animals. These things co evolved. Many of the grass species require both intermittent fire and also the transition through the digestive tract of ruminant to perpetuate their life cycle.

Robb: So if you want a diverse grassland and not monoculture that is amenable only to a non fire, non herbivore environment, which are still going to have to mow it at some point, otherwise you get oxidative breakdown of these grasses which increases the heat footprint of the area and everything, there's a lot of little shit to keep in mind with all this stuff. So it's a good paper. It's accessible. I'm throwing this out there both for the listeners, but more for the folks that they may know that may have some legit questions

and a lot of confusion around this stuff because it complex, it is confusing. But I think this is a very valuable piece.

Nicki: The book that you mentioned, the title is?

Robb: Unsettled.

Nicki: Unsettled. Has it been released yet?

Robb: It's been released. It's actually released by BenBella, the same folks that published Sacred Cow. I'm working my way through it. I have a good science background and it is a lot for me to stay on top of it because you're dealing with ecology, geology, atmospheric physics, chemistry, and this is a point that he made in the beginning. I guess something that was kind of gratifying about it was very similar to the beginning that Diana and I did for our book. We made the point that we're covering ecology, thermodynamics, some elements of economics, and there's whole books, there's whole fields of study on this stuff, and you need a certain steeping to transition this from being magic.

Robb: Again, I don't mean magic in whimsical unicorn stuff, but as in you are so ignorant of the topic that you don't know if it's magic or real. I think Arthur C. Clark said something that a sufficiently, technologically advanced civilization would be indistinguishable for magic because you don't understand the way the stuff works, the way the technology works.

Robb: So we live in a world where lots of specialties exist. It's impossible to be an expert on everything. But if you have some basic steeping in economics, thermodynamics, the evolutionary biology, evolutionary theory, you're at least arriving at the table with a set of skills and some world views that I think you can start making some sense of things and you can start asking some very good questions and maybe pushing back on the areas that ... the difference between what the media is suggesting climate change means for us and what we should do about it versus what the actual published scientific literature.

Nicki: I just love the title of that book Unsettled because frequently it's bandied about that a certain topic or the science around a certain topic is settled.

Robb: In consensus.

Nicki: And in consensus. I know Brett and Heather have talked about this at length, but it's never settled. Unless it's something that's ...

Robb: Some basic things, plate tectonics, a lot of the newtonian physics, some stuff like that is very buttoned up. Every once in a while, an anatomist finds a new muscle.

Nicki: Right.

Robb: We discovered the glymphatic system, which is this lymph system within the brain. So even some things kind of mundane like anatomy, we find new structures in the body and we figure out new uses and purposes and whatnot. I like the title of the book also because the topic is unsettled. One is unsettled even talking about this stuff. It's an uncomfortable place to be because there's a ton of virtue signaling. Fuck, it's dangerous to one's business and livelihood and whatnot asking questions around this.

Robb: I keep waiting for there to be this cancel element push because I talk about these things. It's like, well Robb's involved with LMNT, so let's bury them. They're probably rallying

people to go do that now, but it's a very unsettled time. The unsettled feelings make one uncomfortable, so we just want a quick resolution and we just want an authority figure to come in and make sense of everything, and then we can plant our trees and feel good about what we're doing. I think there's some elements of that that are true, and I think that there's pieces of that that people-

Nicki: Are shortsighted and can lead to some pretty-

Robb: Horrible unintended consequences.

Nicki: Yep. Okay.

Robb: Are you taking over?

Nicki: I'm taking over because I need to scroll down here. Okay, so it's time for our tee shirt review winner for this week. It goes to Lon Daisy. She says, "Is it weird that I found LMNT first then Robb? I found this great product LMNT that gave me just what I was missing in my nutrition and provided that boost I knew I needed but couldn't quite figure out. Keto carnivore leaning, macro counting, workout weirdo. I'm a bit of an alpinist and I love mountaineering, hiking and climbing, more rock than ice, but I hate the gym and I don't like to lift."

Nicki: "As I age, I'm 48, I might need to review that mindset. Anyway, I've never written a review. Your podcast and product inspired me to say hi and send some gratitude your way. I'm not sure I understand all the info you throw at me, but I sure do appreciate you not dumbing it down. Love from Portland, Oregon."

Robb: Nice.

Nicki: Yep. Thank you Lon Daisy. Send us an email at hello@robbwolf.com with your tee shirt size and your mailing address and we'll send you a Healthy Rebellion Radio tee shirt.

Nicki: The Healthy Rebellion Radio is sponsored by our salty AF electrolyte company LMNT. As you know, grapefruit salt was our limited time flavor and we just heard this morning that it will likely be completely sold out by this weekend. I am very saddened by that because it's my favorite.

Robb: I didn't hear that. This is news to me. I didn't realize that.

Nicki: Yeah, so let's see. We're recording this on July 7th and it looks like, by the end of the weekend, it will likely be-

Robb: She gone.

Nicki: ... be gone. I did get a few extra boxes, so I hopefully will have some for a couple months anyway.

Robb: That'll go in a doomsday bunker stash, yeah.

Nicki: I know. I know. Also, it's been hot, so people are loving the salts and finding great benefit from them in this warmer weather. We actually, as you guys know, we've had John Frankel, our jujitsu coach, staying with us for the past few weeks. We have him firmly hooked on chocolate salt in his morning cup of joe. You were talking, Robb,

about ... Somebody asked you about energy drinks and how come LMNT isn't doing an energy drink style of beverage, and how sodium provides that energy boost.

Robb: Yeah, it's one of these things that seems pretty obvious, like throw some caffeine in there, throw some beta alanine. This is where you start going into all these kind of body buildery pre workout drinks. What's been interesting and of course self serving to pump this stuff up, but the cool thing about all this is make the statement, people contest it, and then they see for themselves. But what we find is that, frequently when people are lethargic, they're kind of dragging, low energy, they don't need another shot of coffee. They might need some electrolytes, specifically sodium.

Robb: When we consider that the basic way that we make energy in our body, the APT system and how sodium potassium pumps are the primary drivers of this process, it's kind of like, okay this makes a lot of sense. So someday maybe you'll see some sort of stimulant in an LMNT product, but I don't think that's going to happen anytime soon because what we're finding is the one true energy drink is getting some sort of an electrolyte beverage or adequate electrolytes via your diet at large. That is where you kind of maximize your energy.

Robb: Although I'm a good fan of a good cup of coffee, or tea, or what have you, I think for a lot of people, they just continually go to that ATM machine in their body and keep withdrawing, withdrawing, withdrawing, and we see sleep disturbances and kind of HPTA access dysregulation and all that stuff. When we button up our electrolytes, recovery is faster, sleep is better. So whatever optimum energy one might have had otherwise, I think that's where you find it is getting your electrolytes on point.

Nicki: We hear that again and again from customers. They feel the energy uptick. They feel a boost of energy when they're driving.

Robb: It's in like five minutes, so yeah.

Nicki: Right. Folks, you can get your hands on some LMNT drink [LMNT.com/robb](https://drinkLMNT.com/robb). That's drink L-M-N-T.com/R-O-B-B. Again, the value bundle, you buy three, get a fourth box free. That's the best way to get your salts. Again that URL is drinkLMNT.com/robb.

Robb: There will probably be a great resale market on grapefruit, so maybe make your value bundle that and then eBay that shit later.

Nicki: I didn't even think about that, but there's probably some truth to that.

Robb: We should do that.

Nicki: We should do that.

Robb: We should just buy it from ourselves and then resell it on eBay for like six times the price.

Nicki: It's like lumber inflation.

Robb: Yep.

Nicki: Okay, let's move on to our questions for today, Robb. I don't know that I can continue turning my head to look at you because-

Robb: Just eyes ahead. Just like when driving, eyes ahead.

Nicki: I've got to keep my torso straight here. Okay, Tracy has a question on thin stools. "Hi Robb and Nicki, I hope you and the girls are both well. I'm somewhat of a new listener, having tuned in at some point during the COVID closure, and am now a faithful listener. Thank you for sharing your kindness and wisdom each week. I have a streak of celiac issues on my father's side of the family and suspect that I have at least a sensitivity myself. I'm 32 years old and on and off the gluten free wagon."

Nicki: "I struggle with the planning aspect and maybe more so struggle with speaking up about my intolerance in social and shared family meal settings. I apologize if this information can be found elsewhere, but I do have a lingering but embarrassing question to ask. I find that the girth of my stools vary greatly and I'm wondering if gluten is the culprit. My suspicion is that, when I consume gluten, somehow my stool becomes thin, maybe the diameter of a nickel or quarter, and quite long. Other times my stool is not thin and is quite regular. I don't know if this is a simple, yes X causes Y scenario or if it is a confirmation bias where I'm looking to be correct in finding the cause when I may need to be concerned about something else."

Nicki: "Sorry to be the one to bring up poo. It has been concerning me and I'm relieved to have found a place for this question. Thank you, Tracy."

Robb: It's kind of funny because, when you think about how many times we've talked about poo on the show, and you can just look straight ahead.

Nicki: I feel like I should at you.

Robb: Nicki's back is tweaked.

Nicki: It's like twisting myself.

Robb: We talk a lot of poo and usually isn't off putting to me. But as I was sifting through the bristle stool chart pictures today, I was kind of like blah. So I have a link to the continents.org.aubristlestoolchart. It is helpful and interesting in that the bristle stools three and four, the three being kind of sausage shaped and well formed and all that, and the long thin fall under the acceptable guidelines.

Robb: So I don't know that this is really ... Within this context, it's not really problematic if we're not seeing gas and bloating and stuff like that accompanying the stool. I really don't see there being a potential problem here. Maybe it is speeding up peristalsis a little bit. One of the ... What's a good example. So if you do really hot Thai food or hot Mexican food. So capsicum, which is an irritant, very tasty irritant, but it will cause a speeding up of the GI tract because the gut senses and irritant and it just wants to move that stuff through. So you can get some loose stools and a change in kind of stool composition from that.

Robb: Some folks notice some significant constipation when initially going gluten free because they've had this low level irritant, potentially their whole life or most of their life, so then it takes a while. They may be constipated for a while. People will say, well if I have a little bit of gluten, then things normalize. Not everybody is gluten insensitive. Gluten isn't a problem for everybody. I think it's a bigger problem for more people than what is generally understood, but there are again a lot of kind of moving parts to this thing.

Robb: But for Tracy, it sounds like she's still within the relative bullseye of healthy stool confirmation. Maybe it's gluten. Maybe it's just the fact that there's different types of fermentable fiber in gluten containing products. It definitely is different than eating fruit, for example.

Nicki: Mm-hmm (affirmative). Okay. Our next question is from Brendan on longterm Propecia. "Robb and Nicki, you guys are das bomb. I've been taking Propecia or the generic equivalent for about eight years for male pattern baldness. It hasn't brought my hair back, but it seems to have slowed the progression of my hair loss to a near stop. I eat a paleo diet, do crossfit usually twice a week and get adequate sleep. I don't have any health issues. I'm wondering whether you are aware of any longterm health concerns from using Propecia?"

Nicki: "My doctor doesn't have any concerns, but I wonder. I would hate to be doing longterm harm to myself just for the vanity of keeping my hair. On the other hand, I have a funky looking head, so the shaved head look is probably not for me. Thanks very much, Brendan."

Robb: Oh, Brendan, not everybody can be Jason Statham unfortunately. This perfect dome and look better without hair than with. The fact that Brendan has been using Finasteride/Propecia for eight years means that he's probably one of the people that won't see the negative side effects. There are some. For some people, it's really severe depression, depression in sexual disfunction, like erectile difficulties. For some people, it doesn't go away. They use Propecia for two months and then, three years down the road, they still have sexual issues or depressive problems.

Robb: So what Propecia does is it modifies the conversion of testosterone into dihydrotestosterone. Both men and women need dihydrotestosterone, but dihydrotestosterone feeds into hair loss, it feeds into prostate enlargement, so you need some, but you don't want too much. Insulin resistance can tend to shift the balance in favor of dihydrotestosterone so that's where insulin resistance and things like baldness and also prostate enlargement can be kind of linked together. But the fact Brendan's been using it this long and he didn't mention anything like sexual dysfunction or anything like that-

Nicki: Right.

Robb: I would go out on a limb and say he's one of the people that's probably not going to have problems from this, but there are absolutely problems with it and it's a little bit concerning that the doctor didn't say, "Oh, well some people can experience XYZ."

Nicki: Mm-hmm (affirmative).

Robb: Or maybe this doctor just has not had any reports from his or her patients about this, but it's pretty clear in the product literature. It's well documented. It varies from person to person. Unfortunately, it seems like the doses that are effective at dealing with hair loss seem to be right in the ballpark of causing the other problems.

Nicki: Okay. It's not so bad to have a funky looking head.

Robb: Fortunately, mine is reasonably symmetrical.

Nicki: There are hats.

- Robb:** You seem to like my more or less shaped dome.
- Nicki:** Yeah. Okay, we have a question from Lee on berberine. "Hi Robb, I love the podcast. Longtime listener, first time question. I've recently come across a supplement called berberine. The research suggests it's good for clearing blood glucose by making you more insulin sensitive. Some studies go as far as to say it's comparable to metformin. My question is, given I'm on a paleo lifestyle, does berberine have a place in my diet? I'm thinking it could help clear out some glucose when levels rise due to a higher protein meal and even when having a sweet potatoes and bananas post training."
- Robb:** So this is a really interesting topic and I'll try not to talk too long because Nicki's back is tweaked and all that. Metformin and berberine do work via very similar mechanisms, although their structures are quite different. They inhibit AMP kinase kind of pathway and it shifts mitochondrial metabolism away from a glucose centric metabolism. So there seems to be some ... there's broad ranging potential health benefits from both of these substances.
- Robb:** It is worth mentioning though that, when you look at the longterm use of metformin, it doesn't really enhance a lifespan in humans. It doesn't improve the total longevity of diabetics. I've kind of theorized that may be because these people are still just overeating. So even though it may be mitigating some of the acute problems with say like glucose toxicity, one is still overeating. That is overall going to be mitotoxic. It's going to be difficult or toxic to the mitochondria.
- Robb:** Metformin is considered a mito toxicant. Berberine kind of is. It seems to be a little bit more benign and it also ... Although, metformin is very broad acting. It works on the gut, it works on the muscle, it works on the liver. That's part of the reason why it's really a pretty cool drug. Berberine seems to have even broader acting effects. Brett and Heather, I'll just refer to them on a first name basis here. They've made the point that, when we see a natural analog of a modern pharmaceutical, that they would actually lean more towards the natural analog because there's a potential that our genome and the genome of our fore bearers or other organisms that were related to have had exposure to this stuff. So there's a potential that the detox pathways and the potential problems may be less.
- Robb:** Some people like Peter Retia really like metformin because it's 100% pharmaceutical. You know exactly what you're getting is what you're getting. So different kind of worldviews on that stuff. A piece to this, when Lee mentions that he's thinking about mitigating the glucose response post training, one of the problems with both metformin and berberine is the fact that the way it is modifying mitochondrial and stress signaling is that it's kind of antagonistic towards muscle accretion and adaptation to exercise.
- Robb:** So this is where, on the front end, on maybe first order of thinking, okay we're going to minimize that post prandial glucose spike. I'm not at all concerned about glucose "spikes" from protein meals. I think that is looking way too deeply at this stuff. But the irony is that, if we go about this kind of insulin sensitizing process using berberine or metformin, it may be a win or seemingly a win due to mitigating these blood glucose excursions, but then it may be problematic because it's actually blunting that post exercise adaptation, particularly anabolic signaling within growing muscle and whatnot.
- Robb:** So Lee, I don't know ... it's certainly an interesting compound. I think I could make the case that on days where you do aerobic training, it might be more beneficial. I could make the case for doing it in kind of a punctuated fashion so you use a couple of days on, a couple of days off. I would argue not to use it in a strength training environment

specifically. That would be, in my opinion, one of the best ways to navigate the use of berberine and metformin.

Nicki: He doesn't say whether he feels like he's insulin sensitive or not. He's on a paleo ... he eats paleo. He trains. It'd be interesting to know if he feels like he's got blood sugar regulation issues already or if he's just looking for extra icing on the cake.

Robb: Right.

Nicki: For a lifestyle that might be providing what he needs anyway.

Robb: Which again, were a call-in show someday might be interesting. Those are great questions.

Nicki: Yeah. Okay, it's time for the Healthy Rebellion Radio trivia. Healthy Rebellion Radio sponsor drink LMNT is giving a box of LMNT recharge electrolytes to three lucky winners selected at random who answer the following question correctly. Robb, tell me what is the name of the parasite that causes swimmers itch?

Robb: It's a schistosomiasis schistosome.

Nicki: We'll call it schistosome.

Robb: Was it swimmer cercaria? That was a term I had not been familiar with.

Nicki: It's a dermati ... yeah.

Robb: Dermatitis Cercassia?

Nicki: Cercassia or something like that. Sagan had a little bit of swimmers itch over the last couple of weeks, so we've been learning all about these schistosomal beauties.

Robb: Nicki, what is a proposed pharmaceutical which may prove to be a prophylaxis against swimmers itch?

Nicki: Well, having heard so much about this particular pharmaceutical- ... called Ivermectin, you did some digging to see because you know it's helpful for river blindness and other parasites. So we did search to see if that would be effective for swimmers itch. There was a couple of papers, but-

Robb: A couple of review papers suggesting it might be effective in prophylaxis against swimmers itch.

Nicki: Right. Then we have a friend who is a veterinarian and he sees it in dogs a lot, at least in the Texas area, and there's a different drug that they rely on better for-

Robb: He mentioned that as treatment though.

Nicki: Right.

Robb: I'm still wondering about the prophylaxis.

Nicki: Anyway, so the answer to today's trivia question is schistosome. Bonus points if you spell it correctly. To play, go to robbwolf.com/trivia and enter your answer. We'll

randomly select three people with the correct answer to win a box of electrolytes from drink LMNT. Sadly, it will not be grapefruit flavored. The cut off to answer this week's trivia and be eligible to win is Thursday, July 15th at midnight. Winners will be notified via email and we'll announce the winners on Instagram as well.

Nicki: This is open to residents of the US only. Okay, our fourth question this week is from Adam on pitting edema. "Hi Robb and Nicki, love the show. Books, keto masterclass and now the rebellion online. Keep up the great work. I was just wondering what the best way to tackle pitting edema. Here's the background. I'm a decently lean 36 year old male that has been eating a low carb diet for three years with several years of paleo before that. I've got no underlying health conditions. I'm on no medication. Protein is on point with 170 to 210 grams per day and I weigh 195-200 pounds."

Nicki: "I use sodium in my water and just ordered LMNT after the release of grapefruit, and I lift weights three to four times per week. High intensity-

Robb: Resistance training?

Nicki: ... resistance training one time per week, sauna three times per week, and I walk minimum of 10 kilometers per day. Edema seems to worsen in the heat. Sock marks remain in my lower legs for over an hour at times, and I also have it in my arms. I do have a couple of varicose veins. Any insight would be great. Thank you, keep up the awesome work."

Robb: So a real quick search of looking at pitting edema, and I knew this one, but I just wanted to do some poking around. One of the first things that pops up is the management of hyponatremia. So low blood sodium is really the big driver here. It's interesting, we absolutely need potassium. Most modern diets are woefully deficient in potassium and magnesium. It tends to be too rich in sodium because it's processed food. We tend to get a disproportionate insulin response to these carbohydrate rich, hyperpalatable, easily overeaten foods.

Robb: So we have one section of the populous that is dealing with the problems of hyperinsulinemia, over eating hyperpalatable foods, and sodium is a problem in that context. Then we have people who shift to a largely whole food based, minimally processed diet and it's just god awful difficult to get the full sodium allotment that one needs. Adam is quite active. He's kind of a bigger dude. So I suspect that he's not even remotely on point with his electrolytes, specifically sodium. When you look at the features of hyponatremia, which is edema, swelling, pitting edema, brain fog, headaches, this is right where that falls under.

Robb: So this is one of those easy experiments to make sure-

Nicki: Start ratcheting up your sodium.

Robb: At least five grams a day from all sources. Hot, humid environments, higher activity. We're in Montana now, clearly, and it's not that warm, but it's summer and it's certainly been warmer. The gyms generally don't run air conditioning. They do have some big ass fans that move the air around, but it's hot. My gee when I'm done, it's four or five pounds heavier between my gee and rash guard and everything. It's kind of gross, but it's remarkable when you pick it up and feel how heavy it is.

Robb: On a good training day, I'll use three LMNTs or one gram sodium equivalent during the two, two and a half hours of us training. Then I'll do, depending on how I feel, I'll do

several afterwards. Again, I've been shifting towards using a fair amount of salami at my lunch because it's a great sodium source, doing some olives at lunch. So I end up rounding out my sodium intake from these other areas, but where I used to just feel completely neurologically blown out and exhausted after a pretty ... yesterday was a fairly frisky training day, which also might be part of the reason why my back got tweaked. But there's a bunch of other stories on that.

Robb: I don't get that neurological fatigue that I used to get. This was 10-15 years ago, so I am not younger. I have less youth to lean into with regards to recovery and everything, but I think that for years I was just hyponatremic and I had this tendency to get dizzy when going from seated to standing. Looking back, I also had the pitting edema where my socks would leave kind of a line in my leg. I don't get any of that type of stuff anymore. I think it's sodium and I think that this is a super easy experiment to run to make sure if that is the problem.

Nicki: You'll have to let us know, Adam, if that helps resolve it. Okay, we're onto our fifth and final question this week from Darwin on nicotine and caffeine. He says, "I recently heard you mention a protocol that you developed for the Naval Special Warfare using caffeine and nicotine as a stimulant stack for alertness. Could you go a little deeper or link a summary, if not the protocol? I'm a night pharmacist working seven on, seven off at a hospital and then a few days on my off week. I'm 53 and not bouncing back like I did when I started this foolishness 23 years ago."

Robb: Ouch. Yeah, so when you look at kind of the pharmacology of both caffeine and nicotine, they're both stimulants, but stimulants in different ways. What I had suggested to folks in the military ... It's more applicable to folks in the military and maybe something like this where the person really has an idea of what he or she will be doing. Police and Fire, this was a more difficult one to administer because you don't really know what your schedule is going to look like. But what I recommended, if people knew they were going to be doing some sort of physical activity, then about 50 milligrams of caffeine every two hours.

Robb: A standard cup of coffee, like a Starbucks cup of coffee, is like 200 milligrams. That is generally more than what most people need for an ergogenic effect. To get the main benefits of diminishing perceived exertion, improved cardiac output, mobilizing energy for physical activity, it doesn't take much. Anything above that is actually kind of counterproductive. It's ergolytic. Ironically, for the WADA anti doping testing, the levels at which you will get disqualified for caffeine are at levels that are understood to be ergolytic. They are damaging your performance. They're not helping you.

Robb: So there's an inverse relationship there. If you really wanted to penalize people for using caffeine as an ergogenic aid, it should be at lower intake, not higher intake. But that's all kind of an aside. Caffeine is great for physical activity. Nicotine is interesting. It seems to be a little bit more neurological in action, like just alertness. It doesn't seem to mess with fine motor skills as much. So the basic protocol I recommend was about 50 milligrams of caffeine every two hours. Then, as people are nearing the end of a shift or if they had to dig into a hillside to take a long range shot and they needed to be awake, but they didn't want to have fine motor skills interrupted. Within about three hours of sleep, shifting to more of a nicotine mint, nicotine gum.

Robb: You've got to start off small on this stuff. If you have never used nicotine before and you drop in a four milligram dose, you are going to vomit and poop.

Nicki: And feel terrible.

Robb: Feel absolutely wretched. Again, minimum effective dose is what you want on this stuff. But what's interesting-

Nicki: So like one to two milligrams?

Robb: I would start off at like a half milligram.

Nicki: A half milligram.

Robb: Kind of titrate up, half milligram for a week, and then kind of find ... You can get a little jittery and a little overdone with it, and then you kind of dial it back down. It is absolutely habit forming. If you habituate to using nicotine from gum and mints and then you want to go off it, it's going to kind of suck. There's no two ways around that, but guess what happens when people are used to doing coffee and they go off? They feel like shit. So I don't know that it's really that much of a difference, but the big difference here is, when you look at how nicotine does not disturb going to sleep and remaining sleep relative to caffeine, this is a strategy where if somebody is working a later shift and they want to be awake enough to finish their shift, be awake enough to not make egregious errors, drive home and be safe doing that, I think that the nicotine could be really valuable in that context because then they can drop in, do their good sleep, hygiene, wind down and go to bed.

Nicki: Mm-hmm (affirmative).

Robb: Whereas the caffeine works in different ways. It's kind of more adrenal in action, so you are more in that fight or flight. So physical activity, caffeine, low dose. Appropriate dose seems good, and then more neurological effects, fine motor skills and getting closer to bed, that's when you shift more to the nicotine. Again, that's 50 milligrams caffeine every two hours, ideally when you're in a situation where you can be physically active. Then one to two milligrams of nicotine as you start getting within say three hours of bedtime or in situations where you want to be alert, but you're not necessarily going to be physically active and you might want the maintenance of fine motor skills.

Nicki: So for Darwin, who's a night pharmacist, physically active. He's on his feet walking around. Is that what you mean? It's not like he's doing a workout.

Robb: So what I would do is modest caffeine earlier in the shift and then shifting. So he gets off at 7:00, maybe by-

Nicki: So he's working a 12 hour ... oh no, seven.

Robb: Seven to seven.

Nicki: No, that's seven on seven off.

Robb: Seven off. So he doesn't actually say what the time is.

Nicki: Let's just assume it's an eight hour shift.

Robb: Again, the timing ... What I would do is the last third of the shift, I would completely dial out the caffeine and then just do the nicotine gum or mints.

Nicki: Okay. Awesome. Well, that was our show for this week. Any other final parting thoughts, hubs?

Robb: Pray for our backs.

Nicki: Yes. I think we'll be okay.

Robb: We'll be fine.

Nicki: Just lots of mobility here. Thank you all for joining us. Be sure to check out our show sponsor, LMNT. Go to drinkLMNT.com/robb. That's drinkLMNT.com/robb. Hope you all have a fabulous weekend and week, and we will see you all next week.

Robb: Bye everybody.

Nicki: Bye.