

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 a bold aim to help one million people liberate themselves from the sick-care system. You're listening to The Healthy Rebellion Radio.

Nicki: 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 credential functional medicine practitioner before embarking on any health, dietary or fitness change.

Nicki: 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 bridges in a bunch, well, there's always Disney+.

Robb: Welcome back rebels. Welcome back wife.

Nicki: Welcome hubs.

Robb: We always do a pre-recording test and some of the shit that we ... To make sure that all the stuff is working-

Nicki: To make sure the audio works because we've done more than one show where it didn't record the audio and then you're just like, shit. We always test the audio.

Robb: Some of the shit that we do in tests ... We save a few of them and maybe someday we'll do an outtake reel on that stuff.

Nicki: Today I realized how I can't remember lyrics to-

Robb: Much of anything.

Nicki: ... much of anything. Least of all the Handlebar song.

Robb: You can't fade on me here, wife. That's the only thing holding us together. Sagan, we'll get your math when we're done recording. Thank you.

Nicki: We will check your math, yeah. Thank you.

Robb: She just shoved it through the-

Nicki: Through the door.

Robb: ... through the slot of our door.

Nicki: Okay. At least she did her math. Let's see. How else should we kick off this show.

Robb: I don't know. Clearly, we're homeschooling from afar. Anything you want to report?

Nicki: Let's see here. Well, this is the final week of the Rebel Reset so folks are focused on community and trying to maximize improved community in all the ways that one can during the various states of openness and lockdown across the globe.

Robb: One of our admins, Sybil Cooper, who's a PhD in Immunology, as an aside, Dr. Cooper. She, I believe last reset, went and bought a bunch of fresh food for her local food bank scene.

Nicki: This is this go-around. I think she does it every year.

Robb: I think that that ... Talking about community lit a fire under her to do this and then she's done it again and I think we maybe mentioned this in a previous show. It's really cool. Even though we're in a situation where sometimes direct contact can be a little bit more challenging, just doing something good for someone is fantastic. What was that story that you told me about someone being a prick to someone in line at a drive through deal and then the person-

Nicki: Oh, this was another thing that somebody posted and it was a little ... We have an off topic channel inside the Health Rebellion community and it was this little meme thing where there's a line of cars outside of McDonald's and apparently the person was taking such a long time ordering that the person behind him, she was flipping him off and yelling and getting all frustrated and so he told the person, the-

Robb: Cashier.

Nicki: ... the cashier that he wanted to pay for the car behind him and so then they move up a little bit and he can tell that the person behind, when she gets told that the car in front purchased her meal was embarrassed and she'd really overreacted and here this guy is going to buy her meal and then-

Robb: And you're heading towards this heartwarming-

Nicki: The whole pay it forward, kindness thing. Then when he gets to the next window where you actually take your food he took hers too because he bought it.

Robb: Then she had to get back in line and start the whole thing over.

Nicki: What made you think of that? Oh, community.

Robb: Community. Which sometimes a little community like that is good too. It's like that heartwarming pay it forward do good by people and then sometimes-

Nicki: Sometimes when people are being told they're dicks-

Robb: Fuck you.

Nicki: Yeah, that was kind of funny.

Robb: That was a goodie. Yeah. Did you have something you wanted to read from the rebellion?

Nicki: Yeah, I wanted to share a comment from Susan, one of our Healthy Rebellion community members. She said, "It's 6:00 AM and I'm listening to Healthy Rebellion Radio episode 50 and I have to say that five days with no social media apps on my phone has been awesome. My marriage is even better in just five days. Thank you-

Robb: Is ours any better?

Nicki: I think it is. I don't know, would you agree?

Robb: I would agree. I would agree. But it was so good before. It's just hard to compare.

Nicki: It's nice like ... Instead of ... Gosh, you think that ... I think that we use social media less than the average Joe or Jane, I would say.

Robb: We've been.

Nicki: But at the same time, you still use it way more than you think, on your phone.

Robb: And way more than you need.

Nicki: And way more than you need.

Robb: Yeah.

Nicki: So just having it off of your phone, it's like, yeah, you can still go and see what's going on in the world of your, the handful of people that you really care to follow from your desktop but you're not stuck in that infinite scrolling-

Robb: Just constant scroll and the constant access.

Nicki: ... and the need to check. We went to the gym the other day and I forgot my phone and we were in the car and the garage door was closing and I'm like, "Oh shit, I think I left my phone on the counter", and Robb's like, "Do you want to go get it?" I'm like, "Nah, I don't need it."

Robb: Because if you can't crack into Instagram or Facebook.

Nicki: There's nothing I'm going to look at it. Yeah.

Robb: Yeah.

Nicki: And we're going to the gym and if something happened Robb had his if we needed to-

Robb: Call a tow truck or something.

Nicki: Yeah, so it wasn't an issue and I can't remember the last time I've left my phone and not cared.

Robb: It's funny when your phone is just a phone or maybe a map or maybe a way to check the weather. It's awesome but it's not necessarily every five minutes. Yeah, that's been cool.

Nicki: Yeah. Let's see. Hubs, what do you have for our news topic today?

Robb: An interesting paper and I'm going to be a jerk here at the beginning and then I'll try to put a little bit of balance in this. The title of the paper is Agra-nutrition Research Revisiting the Contribution of Maize and Wheat to Human Nutrition and Health. It's an interesting paper. It's a mixed bag. There's some actually really, really good stuff in here. Putting an eye towards sustainability, putting an eye towards some of the EAT-Lancet recommendations. That everybody everywhere should reduce meat consumption and it actually rightly points out that millions of people globally would be exposed to significant food nutrient deficiencies.

Robb: But then there are some absolute shenanigans in this paper and one of the shenanigans, one line, "Only relative to other quote, nutrient rich food stuffs are cereals, quote, nutrient poor. This terminology reflects the emphasis on micronutrient malnutrition. Most cereals provide varying amounts of proteins, fats, minerals and vitamins in addition to being important sources of dietary energy."

Robb: It is so funny that only relative to dog shit does cat shit not smell good. This is our world. This is the way that you understand things. You order things out in varying degrees of value of significance or impact and this paper is a really interesting mix of this woke sciencism with some otherwise good stuff. Initially I was just going to write this thing off but I read it very carefully and it is so interesting. There's actually some very good points and then there is just to me, bat shit crazy stuff and it is a absolutely fascinating mix.

Robb: I don't know that I've read anything like this. This is one of the most fascinating scientific papers I have ever seen. We should pass it on the Brett Weinstein and his wife-

Nicki: And Heather.

Robb: ... and have them take a peek at it. There's another piece here. "Cereals are the dominant source of carbohydrates in the global diet providing essential food energy which is true." Then it went on to basically explain away the fact that people are rarely ... Other than ... And Diana Rogers and I talked about this and it's very controversial but in general, lack of adequate calories is mainly a political issue like despots limiting the amount of food that people can get either through open trade or through even food aid. It's reasonably easy for most people to at least get enough calories at this point. It doesn't mean that they're getting adequate nutrition, doesn't mean that it's the best diet that they could get but starvation is an outgrowth of political will and forces at this point. Not 100%. There's exceptions to everything but without a doubt an over consumption of calories absent adequate nutrition, which is actually those two things go hand in hand particularly with regards to protein and this is all the stuff again, that we talked about in Sacred Cow, I really alluded to it a lot in Wired to Eat.

Robb: If we don't get enough protein, which protein rich foods by extension have all these micronutrients, which these guys are dismissing in here. That is where satiety signaling comes in and we tend to then not overeat. But it was interesting. It was making these cases that we get too granular in talking about things like stunting versus malnutrition versus hypernutrition and all this stuff. It was trying to weave in these points that there are complex socioeconomic factors in there. Yeah, there are and we need quantifiable biological endpoints to be able to assess what those sociopolitical forces mean and how they impact living organisms.

Robb: You are currently reading the Cynical Theories book.

Nicki: Cynical Theories, yup.

Robb: And it's fascinating. Nikki will read me a couple of pages each day and we can really only handle about two pages of it without your head exploding but it's unpacking all of this critical theory stuff and it'd be interesting to talk to the authors and I may reach out to these folks and maybe try to do a salty talk with them because I really, and maybe I'm reading into this. This is where just getting one side of a perspective ... Maybe they're really wonderful people and they're like, oh no I never meant for it to come across that way but it's such an interesting mix of both reasonable position and also absolutely woo that again, I'm just blown away.

Robb: We have it in the show notes. It's worth a read. It's an accessible paper but I would be interested to see other people's take on this but Diana Rogers actually tagged me on this so I checked it out. Yeah, it's a goodie.

Nicki: Okay, let's move on to our t-shirt winner of the week. This week it goes to T-Money Myleus. I don't know if T-Money is male or female or other but-

Robb: I'm going for male. I don't see many females degrading themselves, calling themselves T-Money but I don't know.

Nicki: You never know. "So much helpful information. This podcast is solid with Robb and Nicki breaking down the science so a dummy like me can understand it. They keep their bias in check and always try to present knowledge and information in a fair and balanced way and I get so much from them that helps my own health and gives me more confidence to move forward in this ever changing space." That's awesome.

Robb: Cool.

Nicki: Yup. T-Money, thank you for your review. Send us an email to hello@robbwolf.com with your t-shirt size and your mailing address and we will send you a Healthy Rebellion Radio t-shirt.

Robb: And T-Money, thank you for just being you.

Nicki: Thank you all. Thanks to all of our listeners for just being you.

Robb: For being you, yes.

Nicki: Everybody give yourself a hug.

Robb: Give someone else a hug too unless they don't want a hug. Personal space and all that stuff.

Nicki: Distance, six feet, all that stuff.

Robb: Although if you don't want a hug, what is that saying about you?

Nicki: It could ... Well, it depends. Now it could say that I think you have COVID and I don't want you coming near me.

Robb: Could mean other stuff too.

Nicki: Yeah, could mean you seem like a creep and I don't want you coming near me.

Robb: Again, there are deeper implications to that at this point. Can anybody really be a creep? If I want to reject a hug from anybody, is that a problem? Is that a statement about me?

Nicki: Oh dear. This could ...

Robb: Just wanted to throw it out there. I'm not looking for an answer. I'm just asking questions.

Nicki: This could get off into the weeds.

Robb: Yeah, yeah.

Nicki: My head is going to a place that I don't think we want to take this show.

Robb: No. Our intro last time was really, really long so we'll try to motor through this.

Nicki: We'll scoot this one along.

Robb: Yeah.

Nicki: Okay. Today's episode of The Healthy Rebellion Radio is sponsored by White Oak Pastures, a six generation, 154 year old family farm in Bluffton, Georgia. If you've been following Robb or listening to our show for any length of time, if you've read Sacred Cow, you know how important regenerative agriculture is for improving the land and the health of our planet. White Oak Pastures is a standout in the regenerative agriculture space. Their beef specifically was shown by a third-party life cycle assessment to be carbon negative and at White Oak-

Robb: And real quickly on that, what that means is it pulls more carbon out of the atmosphere, sequesters it underground than what is produced in it's manufacture.

Nicki: Mm-hmm (affirmative). And at White Oak Pastures they rotate 10 livestock species on open pastures to mimic the predator-prey relationships that are normally found in nature and that positively impacts the land. They maintain high animal welfare standards and regenerate old monocrop farmland while rebuilding their rural community. All of their meats are raised, slaughtered and butchered right on the farm. They also sell organic vegetables, pasture-raised eggs, honey, pet chews, leather items, tallow goods and more artisan products that they make on the farm.

Nicki: With the holidays coming up I just want to mention that White Oak Pastures also has gift certificates so if you have a meat loving person on your holiday list that might be otherwise challenging to buy for, this is the perfect gift that will have them thinking of you with every bite.

Robb: I'm a meat loving person.

Nicki: You are. We often give gift certificates or actually meat bundles as gifts.

Robb: We do.

Nicki: From our favorite farms like White Oak Pastures. Anyway, great idea with the holidays coming up. Go to whiteoakpastures.com/robbwolf. You can shop some special bundles made especially for Healthy Rebellion Radio listeners. You can use code Rebel10 for 10% off regenerative, grass-fed and pasture raised meats. If you decide to purchase the gift certificates the discount won't apply with your purchase but you can pass along the Rebel10 code so your recipient can save when they make their purchase. Again, go to whiteoakpastures.com/robbwolf and the code is Rebel10.

Robb: Awesome.

Nicki: Okay. Question number one for this week is from Michael and he's wondering about some targeted ketogenic carb sources. "Hi Robb, thanks so much for all the work you do. At the beginning of the year I was eating a standard American diet. At the age of 25 I was pre-diabetic, 50 pounds overweight and I had no energy, crashing after almost

every meal. I've been doing keto since March and I'm down 30 pounds despite building considerable amount of muscle from exercise and I've gotten from about 30% to under 15% body fat and I've never felt better."

Nicki: That is awesome, Michael.

Robb: That is super cool, yeah.

Nicki: Congrats. That is really, really good.

Nicki: "Over the last few months I've been eating more of a carnivore diet with the exception of some berries throughout the day and I've also begun doing CrossFit about five to six times a week. I've noticed that for longer endurance workouts I do amazing but for the short, glycolytic eight minute workouts I'm nowhere close to where I want to be. I've read from your keto masterclass as well as on Ketogains that for CrossFit like activity that eating carbs just before an intense workout can be helpful. I have two questions on where to get my carbs on a targeted keto diet. Number one, Ketogains and many resources recommend dextrose as it goes directly to replenishing muscle glycogen. Using ultra processed refined sugar screams against everything I've learned about sticking to real food. I want to try rice or potatoes but do you have thoughts on using ultra refined substances for glucose as opposed to real food? Two, many seem to recommend against fruit and fructose because it goes to replenish liver stores rather than muscle stores. Does liver glycogen not make it into the muscles? Is fruit really the bad guy many low carbers make it out to be? Thanks so much for the work you do. My life has changed in more ways than I can describe thanks to the information you put out there."

Robb: Really good questions and quite a bit to unpack on this. I came from a similar spot in that when I would think about adding carbs to some sort of ketogenic regimen, whole foods, berries, stuff like that. Whole foods are always better. The interesting thing is I think what is happening here ... He said glucose or dextrose, which are the same thing, preferentially tend to refill muscle glycogen which is kind of true. It actually just depends on the status of the muscles versus the liver and some insulin signaling and whatnot. Definitely fructose preferentially fills liver glycogen, which we'll get to in a minute.

Robb: But the amounts of glucose that people are taking pre-workout to get a bump are really small. It's five grams, 10 grams, maybe up to 20 grams but it's a remarkably small amount. This is an opinion piece that could end up being totally wrong but I think what is happening here is more a brain central governor story than the actual amount of carbs consumed. The brain senses our nutrient status, our fuel status, our hormone status clearly also, and when you start a really intense workout like a glycolytic based CrossFit workout even though we are fat adapted and we tend to see mitigations and blood sugar lows because you can shift into ketosis and whatnot, there's a lag time with that and when you start doing a really hard workout whatever your ambient blood glucose level is, it can drop and the brain still doesn't like blood sugar changes all that much and so that can be a stress on the body and there have been studies performed where they will exercise people to failure and then they will let them rinse their mouth with a sweet tasting solution that has no calorie content and people will get another five percent out of their maximum effort.

Robb: There's no caloric content there. It's just the brain perceiving that there might be some calories there so it's like okay, we'll let you go a little more. It's not going to let you dig such a deep hole that you can't recover from it. All of that to say, when I look at the ... One, I don't really think that this is really about muscle glycogen or even really liver

glycogen in this context of an acute high intensity exercise session. The studies that have been done looking at muscle glycogen biopsies of people that are fat adapted, they're pretty much on par with where other athletes are. I think that where there is a difference is just in that pre-workout blood glucose energy status and so I tend to side with the Ketogains folks doing something like the dextrose tablets that are commonly sold for diabetics or these little candies called Smarties, which are dextrose and it doesn't take many of them. The diabetic tablets are usually five grams of dextrose per tab and I used those at Jiu-Jitsu.

Robb: I haven't used them in a long time actually but the cool thing about that and the cool thing about doing that versus say, a pre-made electrolyte dextrose drink is that once that drink is made that's it. The ratios are done. Whereas, what we tend to do is use some element and I've got that to sip on as needed and then I can throw down dextrose tablets completely separate from that and if it's a really frisky day of rolling I might end up getting 20 grams of total carbs in. If it's a more mellow day I may use none but again, I don't think it has anything to do with muscle glycogen per se. I really think it's a brain central governor issue.

Robb: The fruit fructose deal. I go back and forth on this. I think I'm kind of in that peri-carnivore realm and I might get 40 grams, 50 grams of carbs some days from fruit, like effective carbohydrate and I feel pretty good on that and I'm just not sold that this is the most evil thing in the world. Like some people say, "Well, once fall or winter starts coming in you've got to really cut that stuff out." I don't know, maybe but again, looking at the ancestral model is great. I think there's a lot of insight there but somebody doing CrossFit six days a week is actually exercising at both greater volume and intensity than an average hunter/gatherer individual. Is that good or bad? I don't know. There's probably different takes on that.

Robb: But it seems reasonable that you could drop in a little bit of fruit in the context of that and there is some interesting reality to topping off liver glycogen is bad in the context of overeating. Topping off liver glycogen in the context of mitigating a stress response because ever decreasing liver glycogen and muscle glycogen, we will get a greater stress response. Cortisol, epinephrine, trying to goose more energy typically out of the liver so having a little bit of that topped off pre or post training, it doesn't freak me out and this is where doing a little bit of blood work to just monitor triglycerides and A1C and all that stuff seems completely reasonable but again, there are some people that are like, "You should never eat fruit ever", and clearly we have fruitarians that that's the only thing that you should eat. There are people that succeed at both ends of that spectrum so I would just do some tinkering in that realm but ...

Robb: Did I miss anything? Is there anything else I should do on that? I think that's the bulk of it.

Nicki: I think that was the bulk of it. Yeah, he's mainly doing berries throughout the day, which seems completely reasonable especially giving his activity level.

Robb: Yeah, for sure, for sure.

Nicki: Just keeping it seasonal and local if possible.

Robb: Yeah. Right now we are phasing out of the melon ... We did a lot of melon over the summer, particularly for the girls.

Nicki: The girls can put the hurt on the watermelon.

Robb: Yeah. Now we're shifting more into apples and citrus. Ironically though the apples, which are higher fructose, the girls would eat 10 apples a day if we'd let them but they'll just go wild on them and then they get a tummy ache.

Nicki: They'll get a tummy ache too.

Robb: Yeah, yeah.

Nicki: They have to have some built in self limiting factor, I guess.

Robb: Yeah, and the gut ache is ... When they ask us, "Can I have another apple?" It's like, "Do you want a gut ache?" They're like, "Yes." "Okay, go for it." Time to learn consequences, kid.

Nicki: Exactly.

Robb: It's a hard world out there, kid.

Nicki: Okay. Our next question is from Jane. She wants to know if ice immersion blunts muscle growth post workout. "Hello Robb and Nicki, I'm wondering whether ice cold bath immersions between sauna sessions post weightlifting might blunt muscle growth effects of my workout. I noticed that if I sauna post workout I almost feel an additional growth spurt, if that makes sense, but sometimes with the cold bath in between I don't feel as much benefit. Of course this could be all in my head but I'd love your thoughts. Thanks again for being such great leaders in the world of health and well-being. I'm constantly refreshing your website in hope of a new salty talk or podcast. I just love them so much."

Robb: Cool, cool.

Nicki: That's awesome, Jane. Thank you.

Robb: Yeah, there are good literature sources suggesting that cold immersion post training is not actually great for an adaptation response. We do actually want that inflammatory process to occur and this is where some interesting things, like everybody gets very geeked out on EPA DHA, the long chain omega-3 fats, which are very important, most people don't get enough of them but because the arachidonic acid omega-6 pathway is pro-inflammatory ... There was this period of time and it vacillates back and forth but there are folks that will say, "Well, you just don't want to goose that side of things at all", but interestingly arachidonic acid supplementation has been found to be beneficial for muscle gain and it appears to be a pro-inflammatory process. This is where it's hard for people to hold seemingly antagonistic truths in their head at the same time.

Robb: Do we live in a world that is generally too pro-inflammatory? Yes. Do we want to suppress inflammation at every turn? No. This cold water immersion is a good example. I think a great application for cold water immersion, like if you had a multi-day event like when people are doing the multi-day Spartan races and stuff like that. You're not concerned about a training stimulus at that event. You're concerned about-

Nicki: Recovery.

Robb: ... getting back in the fight again and similar to if you had if you had a multi-day Jiu-Jitsu tournament or anything like that where you've got to perform again and again and again. I think cold water immersion in between is a good idea but we're not focusing on

recovery or adaptation specifically. We're mitigating inflammation so that we can get back in and do it again.

Robb: When you want to make actual adaptations and improve, then we need that inflammatory response and we need the downtime to be able to deal with that downtime. There's pretty good research out there that hot water exposure, sauna exposure, heat exposure tends to enhance that inflammatory process in a favorable way and this is very similar to the Eastern European, Russian approach to sprains and strains versus what has traditionally been the Western approach. We have the RICE idea of rest, ice, compression, elevation. Virtually nothing about that ended up being factual.

Robb: The flip side is heat, mobility up to the limit of pain and reinjury. So if you sprain your ankle you want to ... Even if you have to use crutches but you walk on it as much as you can. You get as much range of movement as you can. Heat the thing up. It gets purple and it bruises and it looks like dog shit and it heals better than rest, ice, compression, elevation. I think that these are ways to look at this so it's not to say that ice is completely worthless, like an ice bath or something like that but I think you really want to consider when you want to do it.

Robb: There is a reality and I think we've got a cryotherapy question here in just the next one up. Cold water immersion, there is a hormetic stress response associated with that. There is an improvement in insulin signaling associated with that. Again, it's not to say that you wouldn't necessarily want to do that but-

Nicki: Just not immediately after a training session where you're trying to make some gains.

Robb: ... not immediately after training. I could almost make the case to do it an hour before training certainly versus an hour after training or something. Or if you're going to train in the afternoon, do that cold water immersion in the morning and really separate it significantly and then maybe a warm water immersion or sauna post-training. Yeah.

Nicki: Cool. Okay. Our next question is from Chunk on a poor man's cryotherapy. He says, "I wonder what you think about an idea, not an original idea, that I have about how to get cold. I know that several people, Brad Kearns and others, have been using an electric freezer chest and filling it with water, then cooling the water for cold plunges. I've been thinking about using a freezer chest, keeping it very cold but not adding water. Not sure if you've ever been in a Costco cold room, but I think that effect could be duplicated with this concept, sort of a poor man's cryotherapy chamber. It would eliminate the need to clean and change the water and I would only close the top if I was certain I could not lock myself in. Perhaps I could use something else to close me in or maybe I wouldn't need to."

Robb: How about just not put your head under.

Nicki: "I'm also concerned about sticking to the sides. I've been unable to find anything online about the idea and I've never seen anything with a live human in a freezer. I think there could be a nice benefit with this approach. I wonder what you think. Thanks, Chunk." He's a 69 year old rebel with epigenetic biological age of 57.

Robb: Kicking ass, nice. I clearly do have some sort of ... What's the fear of confined spaces?

Nicki: Claustrophobia.

Robb: Claustrophobia. Oh God, that just makes me a little crazy so I pulled up a piece from engineeringtoolbox.com/thermalconductivity. The thermal conductivity of water is at least 24 times greater than that of air and it varies on whether or not, what the actual starting temperature of the air is and the moisture content of the air but 24 times is pretty good. This is why you could be in cold air and certainly get cold, can suffer hypothermia with adequate exposure but it happens in minutes if you're in very cold water.

Nicki: Water?

Robb: Yeah. It is so much faster and here's a great examples of this. If you have a balloon that is filled with air and you put a match to it the balloon will pop. If you put water in a balloon and you put a match to it it will not pop and over the course of time, at least not initially, but the water is so efficient at moving heat away from the surface of the balloon that it's not going to pop.

Nicki: This is a good science experiment we could do with the kids.

Robb: It's a great science experiment and this is actually the way that some indigenous peoples ... We assume that there was no type of boiling or soup making or whatnot until people made ceramic pottery but in fact, people would use leather bags, get the leather wet throughout, have it filled with liquid and then you could literally just drop it in the coals and the thermal conductivity of the water was so good that it would wick the heat away from the heat source and distribute it through the system and there's ways you can fuck this up by having a really hot spot or a dry piece or whatever but it's remarkably efficient.

Robb: Chuck, the long and short to this is something like this will work but you will need orders of magnitude, longer exposure for it to really work.

Nicki: So you're sitting in the freezer for two hours instead of the five minute.

Robb: You're going to be in there quite, quite long. Yeah. This is part of the reason why the real cryotherapy chambers that use liquid nitrogen or whatever it is that goes in there. Those things are like minus 270 degrees of something like that so it's very, very cold and it's that then temperature difference but also it has very low relative thermal conductivity. Just as an aside, the thermal conductivity of copper is 1400 times that of air and this is why a piece of hot metal, and this depends on the type of metal. A piece of hot metal can burn you so terribly compared to a blast of hot air, which certainly can be nasty but sitting on a lawn chair that's made out of metal and it's sitting in the sun. It'll fucking get you because it contains this energy and it releases that energy very, very efficiently compared to say-

Nicki: Vinyl or a different a type of a seat.

Robb: Vinyl or something like that. Yeah, vinyl can be hot but it's thermal conductivity, it's heat mass is relatively though and this is some important physics stuff again, which we try to impart to our kids through getting surface area down and now we're starting to talk a little bit about density and some of this thermal conductivity stuff is definitely something that's coming up. I don't want to toot my horn. I'm not the smartest dude in the room or anything but it's understanding some really fundamental principles of physics like this, physics and engineering, that you can figure out a lot of what's going on in the world. Not everything, not every detail but it doesn't even need to be a math-based exposure to this stuff but a conceptual based understanding and then some

experience where you put water in a balloon and put a flame under it and it doesn't pop. You can't not pop it with a spark, if just an air filled balloon.

Robb: So Chuck, to answer your question other than our digression into engineering and science. I think it could work. For the love of God, don't lock yourself in the freezer. That just terrifies me.

Nicki: No, also, your oxygen would run out at some point too depending on how long you were in there.

Robb: Yeah. I think you would die of suffocation before you die of freezing but both of those just give me the heebie jeebies. To this effect, the magnitude of the cold does start becoming important but ... Gosh, I forget who talked about this. Might've been on one of Rhonda Patrick's shows but I forget who it was. Just running a cold bath, like whatever the water comes out of your tap and it's 70 degrees or maybe in the 60s or something. That is plenty cold to get a really remarkable response. This is one of the things that's a little bit funny about the biohacking scene. You don't need to take a freezer and fill it with water and be in there like, I have to do my Wim Hof breathing or I'm going to die in this thing. Just some cold water exposure is plenty because it's 24 times, 25 times more effective than air. It doesn't need to be mind numbingly cold for it to have a really profound effect.

Robb: Yeah, that's all I'm going to say about that. I do think there's a diminishing return around this stuff. Again, where people are like, "the more extreme the better, I'm in this cold water"

Nicki: How often are people doing cold plunges? I guess some people do them every day.

Robb: Some people do them every day.

Nicki: Okay, because I was just thinking-

Robb: Like our friend Jason Kilgor here does them most days.

Nicki: Okay, because I was just thinking a bag of ice is what, two bucks, five bucks?

Robb: Mm-hmm (affirmative).

Nicki: If you were doing it weekly as part of your training regimen, obviously if you did it daily it would add up but you could just fill your bathtub and add a bag of ice.

Robb: Even to that effect, most people have a refrigerator that have a tray of ice in it that you can empty. Run your bath, dump some ice in it, swizzle it and the moment that the last ice cube disappears then you jump in because that's the coldest the water is going to be because the ice has gone through a phase transition from solid to liquid and that consumes heat or necessitates endothermic action and so that's ... The moment that's done then you jump in from that moment on then it begins heating.

Nicki: Then it's getting warmer and then your body is warming it up too.

Robb: Yes. It's like a pendulum swinging and you're just getting it right as the pendulum swings through the absolute bottom of the arc. Yeah.

Nicki: Okay. I think it's time for The Healthy Rebellion Radio trivia. This is our White Oak Pastures prize. Their beef sample kit.

Robb: I want to win this.

Nicki: Including two boneless rib eyes, two filets, three ground beef, three snack sticks, spicy, herb and original. It's going to one lucky winner selected at random who answers the following question correctly.

Nicki: This question came from Elizabeth on our team. She wanted to know, "Robb, what is your total time in training BJJ to get to your brown belt?"

Robb: Consistent training has been since 2012. I've been quite consistent. I had actually about a year that I just trained with a friend and then we had the seven months that we moved here and you and I trained twice during that block of time but basically eight years although, truth be told, the very first time that I did Brazilian Jiu-Jitsu was in 1993 but I didn't do Jiu-Jitsu again in a formal setting until 2004 with John Frankel. That was for a week here and there.

Nicki: That was when he had moved to Chico and he was opening more Cal martial arts.

Robb: He had moved to Chico.

Nicki: And you were just opening CrossFit NorCal. That was right around when we met for the first time.

Robb: Running the capoeira group.

Nicki: Yeah, so then you trained a little bit with John.

Robb: Very little bit.

Nicki: Then he ended up moving back to Crea.

Robb: I knew I liked Jiu-Jitsu. I knew what good coaching was but it was not until 2012 that I really carved out a spot where I could do it consistently and have been going. So about eight years to get my brown belt.

Nicki: Okay, so eight years is the answer. To play go to robbwolf.com/trivia and enter your answer. We'll randomly select one person with the correct answer to win the White Oak Pastures beef sample kit and the cut off to answer this week's trivia and be eligible to win is Thursday, October 22nd at midnight. The winner will be notified via email and we'll announce the winners on Instagram as well. That is the day after my birthday. This is open to residents of the US only.

Robb: Maybe you can win this thing.

Nicki: I had to throw that in there. Okay. Our next question is from Ralph on BPH, benign prostatic hyperplasia. "Hi Rob, I'd love to hear if you have talked to any older paleo or keto men about solutions for benign prostatic hyperplasia, which most men have to deal with in their late 60s and beyond. Main symptom is needing to pee often which causes problems with sleep. Any ideas for solutions would be greatly appreciated. I love the show. Thanks, Ralph", and Ralph says he's 72 years old.

Robb: Awesome. Although, he didn't mention what is epigenetic age was although I think some of that stuff is silly. Ralph, yeah this is a pretty common problem. It's interesting when you dig into what the mechanism of causation is. It appears that some people, the conversion of testosterone into dihydrotestosterone may drive the prostate cell growth, which then impacts the need to pee more frequently. For some people it looks like estrogen or estrogen metabolites are the problem and so some of the prescription drugs for this ... One will work for someone. Another one will make it worse. It's really a grab bag. I threw a link in here to a product from Life Extension. It's their ultra prostate formula. Have recommended that to a good number of people and it seems to work really, really well and for some people they end up taking a pretty significant dose. They may take four capsules three times a day, which is non-trivial in the price but it really, really helps on the getting through the day and getting through the sleep side.

Robb: Interestingly also as per Chris Masterjohn, doing about a quarter to a half a teaspoon of salt, table salt, immediately before bed. You just swizzle it in the barest amount of water. You don't want to put that much raw salt in your mouth. It can be irritating the mucous membranes but just putting a tiny bit of salt in water and shooting that down immediately before bed. A ton of folks have mentioned that, both men and women, that the need to pee during the middle of the night is decreased because-

Nicki: It just helps sleep in general.

Robb: ... it down regulates antidiuretic hormones so that's a big one. Then finally, I have another paper linked here. Phosphodiesterase type 5 inhibitors for the treatment of male lower urinary tract symptoms. If you're not familiar with what phosphodiesterase type 5 inhibitors are, this is basically like Viagra and the spinoffs around that. But it's interesting. It really does seem to help with these symptoms. So you can use that during the day. You could use it pre-training because these things like Viagra appear to also be non-trivial myostatin inhibitors so it could help with age related muscle mass loss and of course, there's all the other potential side effects that could spin out from that so those are a couple of suggestions around that.

Robb: Then the standard clap drop like lower carb diets tend to be beneficial in this story. Elevated insulin levels definitely exacerbate this, appropriate Vitamin D status, getting adequate light. All those things are definitely, appear to be beneficial when you look at both the anecdote and the literature.

Nicki: Okay. Man, I feel like we're flying through this episode. We're already on question five.

Robb: Well, I didn't have a 40 minute intro this time like I did last time.

Nicki: This is true. This is true. Okay, our last question this week is from Julie and she has a question about viruses in meat. Julie says, "I recently heard your broadcast on revolution health. I do eat meat but I've been avoiding chicken not only because of the inhumane treatment but also the use of antibiotics and most recently the studies that have come out about viruses in chicken meat. I was relieved to hear that beef might actually be healthier and also environmentally friendly. Now my husband told me about polyoma viruses in beef that can survive cooking temperatures. Is this something that is being studied closely? Is it conclusive? Is there a way to avoid it other than avoiding meat and do we have to wait for another vaccine like the HPV vaccine before we can safely eat chicken or beef? I would love to hear a podcast on the subject. Thanks, Julie."

Robb: So several links in here. First one polyoma viruses and human disease and a little piece from that. Polyoma viruses are small non-developed DNA-

- Nicki:** Non-enveloped.
- Robb:** Non-enveloped DNA viruses which are widespread in nature and that's a key part to takeaway. They are widespread in nature. They are ubiquitous. They are everywhere. They're in all mammals, all avian species, so they're all over the place. In immunocompetent hosts, the viruses remain latent after primary infection with few exceptions. Illnesses associated with these viruses occur in times of immune compromise especially in conditions that bring about T-cell deficiency.
- Robb:** This is another important piece to keep in mind. In general these things are pretty much benign but like anything, if you run yourself down, don't eat well, don't sleep well, then there can be some problems. There are associations of these viruses and Epstein-Barr virus and a host of other viruses with different types of cancer. Epstein-Barr virus, the estimate is that 95, 98% of all humans have it. It is largely benign in most people but in certain individuals it appears that it could feed into certain types of cancer. In some individuals it may be an underpinning in the development of things like chronic fatigue, fibromyalgia. This is some of that long-haul syndrome that COVID is getting so much attention for but has been probably a background feature of a wide variety of infections forever, literally since time began, and most of the attention that's being put to the COVID virus, I really hope some of that is readdressed to some of these other long-haul viruses.
- Robb:** When you look at the long term problems of influenza exposure, Epstein-Barr virus exposure, the literature is thick with reports of people experiencing long term problems. Neurological problems, metabolic problems, all this type of stuff. The point being is that as long as we live in a natural environment, which I don't think that we would want to live in an unnatural environment and we can't seem to construct a supernatural environment, this is just what we're stuck with so I think that this is one of these things of majoring in the minors.
- Robb:** One final, or no I guess two more papers. African great apes are naturally infected with polyoma viruses closely related to Merkel cell polyoma virus, which the Merkel cell polyoma virus is one of these viruses that ... It's a type of cancer, basically. All primates are infected with these and we cross infect and reinfect and in some situations it's benign and in some situations it's problematic. Becoming vegan is not going to fix this mainly because you've already eaten meat and you probably have some viral load associated with it and then you have to deal with all the other problems of being vegan. It's not really the way to deal with this.
- Robb:** Then I have one final paper if people really want to geek out on this. The ancient evolutionary history of polyoma viruses and it's a great ... It's actually a really interesting paper looking at the likely evolutionary lineage of these viruses and to coevolution between both mammalian species and avian species and these polyoma viruses. As an aside, some of what they maybe, the role they maybe playing is actually goosing some element of evolutionary randomness by gene insertions and whatnot. Again-
- Nicki:** So getting yourself as healthy as possible, strong immune system so you're not immune compromised, you're pretty much good to go. So you want to maximize protein intake, be strong, be healthy.
- Robb:** Yes.
- Nicki:** And then this thing that we all potentially have already that's latent won't manifest.

Robb: Most likely not.

Nicki: Most likely.

Robb: This is where people say, "Well, there's a chance." It's like yeah, there's a chance the sun may explode tomorrow. It is super small but yeah, so this is where people also need to get more comfortable with probabilities instead of nailing down these certitude type scenarios and also asking the question. Okay, if there's a risk profile here what is it really and what is the risk profile of deleting meat out of the diet? It's not a free lunch. You got to eat something else. What is it that you're going to eat and what are the upsides and downsides of doing that?

Robb: Again, maybe putting on the evolutionary lens, humans and prehuman ancestors have been eating some type of animal products for three million years, four million years, something like that. They're not entirely sure but it's been a longstanding feature. All primates have these things. All avian species have these things. It can be problematic in some circumstances, completely benign in other circumstances and at the end of the day I'm absolutely befuddled how you would avoid this and when we consider things like COVID or influenza like people forget ... What was it? The 2009 H1N1. That was a pretty nasty flavor of influenza. Being metabolically healthy dramatically improves your likelihood of favorable outcomes under all these circumstances.

Robb: Again, this is where I think folks start majoring in the minors and they'll be like, "Haha, meat has polyoma viruses." It's like yeah, and that effects the price of rice in China exactly how? It just doesn't matter or if it does matter, explain to me how it does and explain to me also what are the trade offs associated with doing anything about this other than just being as healthy as you can.

Nicki: Right. Okay. That's our episode.

Robb: That part was longer. I knew I should drag it out a little bit.

Nicki: Anything else you want to add?

Robb: I don't think so. I don't think so.

Nicki: Okay. All right, folks. Thank you all for joining us. Please check out our show sponsor, White Oak Pastures, pasture meats, gift certificates for your friends and family over the holidays. You can check all of their lovely, lovely goodies out at whiteoakpastures.com/robbwolf. That's R-O-B-B-W-O-L-F and enter code Rebel10 to get 10% off your product total for first time customers. Again, that's whiteoakpastures.com/robbwolf and that code is Rebel10. Thanks everyone.

Robb: Bye everybody.

Nicki: We'll see you next time.