

**Nicki:** It's time to make your health an act of rebellion. We're tackling personalized nutrition, metabolic flexibility, resilient aging, and answering your diet and lifestyle questions. This is the only show with the bold aim to help 1 million people liberate themselves from the sick care system.

**Nicki:** 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 changes. Warning Robb gets passionate, he's been known to use the occasion expletive. If foul language is not your thing. If it gets your britches in a bunch, well there's always Disney+.

**Robb:** What's up wife?

**Nicki:** It's time for another episode.

**Robb:** It's.

**Nicki:** It's time-

**Robb:** Time.

**Nicki:** For another episode of The Healthy Rebellion Radio. Welcome everyone to our crazy little moment in time here. It is a nice day here in New Braunfels, Texas though.

**Robb:** It is pretty nice. Sun is coming out. It's going to be nice and warm, so yeah.

**Nicki:** We had a lot of rain last night and it's looking like the fog is burning off and it's a good day.

**Robb:** Mats are being delivered to Straight Blast Gym Texas today, which this podcast will air a bit after this, but very excited for jiu-jitsu to get going.

**Nicki:** Absolutely. What do you have for us today with your news topic?

**Robb:** Oh, the news topic. The title is Silicon Ranch partners with organic livestock farm in Georgia for solar sheep grazing. So today's topic is a bit of a sustainability regenerative ag story, but it's pretty cool. White Oak Pastures pastures has partnered with this outfit Silicon Ranch, which is basically one of these big solar farm outfits and what's emerging out of this story is the potential upsides of solar energy can be welded to another upside of solar energy, which is grazing animals.

**Robb:** People kind of forget the whole solar powered feature of pastures and grazing animals and whatnot. But White Oak Pastures has this research that demonstrates that their meat production is a net carbon sink. It has all kinds of beneficial effects on local ecology birds that interestingly the Audubon Society, this is some of this stuff that's really

important and I'm looking forward to Sacred Cow getting out there both in the film and the book form, but people assume that ranching in animal husbandry is necessarily injurious to the environment.

**Robb:** But the Audubon Society has been one of the folks that has really embraced the Allan Savory kind of flavor of regenerative ag. So anyway, within this-

**Nicki:** Because of the impact on the birds.

**Robb:** Because of the beneficial impact on the birds. People who look at birds and want to protect birds, they're finding that the habitat is being restored and that animals that were endangered or had not been seen in particular areas for 15 or 20 years are now back in large numbers.

**Robb:** So this is some of the really important stuff to get out there and to talk about and to have discussions around because there's just a monotone that animals are bad, animal husbandry is bad and that may not be the case. It may in fact be a story of this is one of the only legitimate solutions that we have. And what's interesting is they're predicting millions and millions of acres globally that will be under use with these solar farms, which is great.

**Robb:** It has some challenges in and of itself. Solar panels actually have a limited life cycle and the recycling of that stuff is pretty toxic and difficult. So I'm optimistic about solar energy, but it is by no means a free lunch in that story. But what's interesting is mixed into that whole process is the opportunity to have vast numbers of grazing animals that maintain those areas and maintain the normal ecology and produce food.

**Robb:** And so this is something that when people kind of hand wringing about, "Oh, how do we feed the world going forward?" There are enormous tracks of land that are amenable to nothing but the raising of animals on grass. So this is a great article and it points out kind of an intersection of technology that is arguably 10,000 years old with technology that is 50 years old, photovoltaics and then holistically managed grass eating animals. So cool article, we've got the link for you in the show notes. Please read that. Please share it with people.

**Nicki:** And we actually interviewed Will Harris of White Oak Pastures as a live interview inside The Healthy Rebellion community and it was amazing and we will be excited to share that interview with y'all here in another month or so, but just can't say enough about what he is doing for not only his local economy, but the land and the animals and you just get this amazing, I don't know, richness and just goodness listening to him speak and what he's done over his lifetime with his animal.

**Robb:** And just a real quick, maybe a highlight on that Will was a very successful conventional meat producer and he said that he was one of the best at it, which interestingly he said was likely why his farmland ended up cratering perhaps the earliest because he had figured out such an extractive process that the grasses were failing, the soil was failing

and it wasn't good for him, wasn't good for the animals, wasn't good for the local environment.

**Robb:** And Will's a good old boy from the South and likes to make money and all the rest of that. But at the same time he started seeing not only an economic kind of brick wall facing him, but also just some stuff that it is kind of moral core he couldn't really deal with. And what's interesting is it was a slow iterative process, but these holistic management practices are what he ended up adopting. And it's been both economically successful for him, but then also environmentally it's a major, major win.

**Robb:** So these are the stories that we've got to both critically assess like are they legit? Is what is being claimed here true? Let's be honest about that. But if it is, then we need to be singing this stuff from the rooftops. It can't just be game changers and pea protein all the live long day.

**Nicki:** Awesome. Already it's time for our Healthy Rebellion Radio t-shirt review winner. This one is from, I don't know if it's even pronounceable, G-O-U-K-U-G-T, goukugt.

**Robb:** Goukugt.

**Nicki:** Thank you for all your positive influence. Thank you Robb and Nicki, I've been a listener since 2012 and I found paleo to help cure my arthritis. I was 28 and in grad school, which is too young for a chronic illness. I found that the trigger was wheat and I've been arthritis free since then. I've always been inspired by your work and my research has steered towards using diet as a therapeutic tool.

**Nicki:** I study polycystic kidney disease and I've published two papers this past year on the impact that ketosis and oxalates have on disease progression. I wouldn't have been able to do this without first healing myself so that I could still hold a pipette. Keep doing the great work you do and inspire more out there like myself, Dr. Jacob T. Awesome Dr Jacob T. thank you.

**Nicki:** Please send us an email to [hello@robbwolf.com](mailto:hello@robbwolf.com) with your tee shirt size and your mailing address and we will send you a Healthy Rebellion Radio t-shirt.

**Robb:** Awesome.

**Nicki:** All right. This episode of The Healthy Rebellion Radio is sponsored by Perfect Keto. Perfect Keto makes eating keto easier. Perfect Keto provides clean, low-carb bars, nut butters and supplements and the best keto recipes and information so that you can keto with confidence. And Robb, we just got a box of their brand new keto birthday cake bar, which is quite good. I normally am not a birthday cake flavor kind of girl.

**Robb:** Just like you're not a cheese girl.

**Nicki:** I'm not a cheese girl either, but I really liked it.

**Robb:** You liked it, Sagan liked it. The mouth feel was good. And what's interesting about this stuff too is the girls generally like these things, but they'll do a half of one or one and then they're done. So it's not like that-

**Nicki:** They want to go back to that.

**Robb:** Cocaine thing where they're going to want to like smash the whole box, which I think is of telling.

**Nicki:** So if you haven't checked out their lineup of keto snacks and bars, go to [perfectketo.com/rebellion10](https://perfectketo.com/rebellion10) and use code REBELLION10 for \$10 off orders of \$40 or more. And Robb this here is a live call episode.

**Robb:** Well, right here, Nicki, we have a live episode.

**Nicki:** We have a live call, but this might be our last live call, at least for a wee bit.

**Robb:** It's super fun to be able to ask people additional questions, but the technical challenges of pulling this off were kind of crazy.

**Nicki:** It was a cool experiment and I think we've really enjoyed it, but here's the challenge that we face when we first go live. And we were using a thing that we can see the people in queue when we first go live, we see there's like five or six callers there, but we don't really have a way to communicate with people to tell them where they're at in line.

**Nicki:** And so then we'll take the first person's question and then by the time we're done with the first person question, the other people have hung up because they're like, they have no idea how long they're going to have to wait. So they're like, "Oh, screw this. I don't want to sit here for 30 minutes or an hour." So then we answer one question and then we're sitting and we have no callers on the line.

**Nicki:** And so then we're waiting and waiting and maybe we get another one. And so it's been... We've blocked them. When we did them, we did an hour and a half slot and it was kind of challenging to get our five callers for the show during that hour and a half block because of the way what I just described with-

**Robb:** We might have 20 people call in but we're only able to grab-

**Nicki:** But then because of how-

**Robb:** A few of them.

**Nicki:** So did a little reflection and I think we're going to hold off on that until we can come up with a little bit of a better-

**Robb:** We need a little better technology.

**Nicki:** System.

**Robb:** We need a little better system. It'd be fun to do something like this in the future. In The Healthy Rebellion, we are doing some text chats in there which live text chats-

**Nicki:** Which have been really fun.

**Robb:** Which had been really fun. So we're going to start putting more emphasis on that because that's a great way to interact with people, get some live back and forth, ask those lead on questions. But it's much more technologically doable for us at this point.

**Nicki:** Right. So I guess-

**Robb:** So for now, this is the last live call.

**Nicki:** Yep. Until we figure out a way to solve for this, then we'll be doing our regular Q and A. So you guys can always submit your questions via the website, robbwolf.com and then let's jump into our callers.

**Nicki:** Hello. Welcome to The Healthy Rebellion Radio caller from seven eight five tell us your name, where you're calling from in your question please.

**Ben:** Hello, Robb and Nicki. This is Ben from Ruleville.

**Nicki:** Hey Ben, thanks for your patience.

**Ben:** Oh, no problem. I have kind of a two part question, a small question then maybe a bigger concept related to it. I wanted to know if you or Robb had any insight on supplementing with fulvic acid or sometimes I think Ayurvedic realm is called shilajit, but it's like that black tar substance. But in a broader sense, the reason I ask that is because I have read some stuff on it and started messing around with it myself because what I've read it's there to fill any gaps that were missing from the farming or the current state of agriculture, depleting the minerals from the soil.

**Ben:** So we used to get a lot of trace minerals from ground root vegetables and things like that, but now we're missing that either through agricultural depletion or then the washing and transport of these vegetables or whatever. So I just wanted to hear you guys' take on any of that. If it's a valuable thing to supplement with or it's even an issue we should worry about.

**Robb:** Oh man. So I'm not familiar with that term. There was a substance that Dr. Fred Hatfield ages ago mentioned it sounds like this, and it was called Mumi, M-U-M-I. And it was kind of this tare substance. It was supposed to be really nutrient dense, but I mean, I heard about this in the late 80s early 90s and then I really haven't heard anything since then.

**Robb:** And similar to being able to sing along to like Scooby doo and stuff like that. It's a piece of obscure information that just lodged in my head and I don't know that it has any

relevance to today at all. In general supplementation with Foley is a little bit of a tricky story which is kind of separate from just the basic mineral piece.

**Robb:** Chris Master John has done a pretty interesting look at I guess methylation status and what not and is really kind of arrived at this idea that riboflavin supplementation is kind of the master governor for the whole methylation story for the MTRR gene mutations or gene permutations. On the mineral side it makes sense to me to try to round out our minerals and trace minerals.

**Robb:** I think that this is where things like sea food and sea vegetables are probably a pretty good plan. It at least in some regards because at a minimum I think that other than adding pollutants to sea water, the mineral composition of the water itself and the critters in it has probably changed less in state, like the less 10,000 and a hundred thousand years then our soil has.

**Robb:** And so it I don't know that you fully deal with selenium and a few other trace minerals in that context, but I do think that just a real judicious application of sea vegetables and seafood could probably plug a lot of the holes and kind of the deficiencies of a modern agricultural diet.

**Robb:** I would make the case that this is one of those things that I think it's going to take a while to fully vet this out, but when you have meat in particular meat that is produced on a patch of dirt that has really solid holistic management, regenerative farming practices, you're feeding the soil microbiome in a way that those critters are then mining various nutrients out of the soil and putting it into grass.

**Robb:** And then that goes into the animals and it's pretty early. But I think that there's a powerful case to be made that you probably have a better nutrient profile than with the industrial agriculture approach, which is putting synthetic fertilizer in all of the activity is happening right there at the surface of the soil and you're actually kind of destroying that deeper microbial interaction that mines minerals.

**Robb:** So I think that over the course of time, this is another one of these cases for why regenerative farming is probably going to be really important. I don't know if that entirely answers your question. That's kind of what I've got.

**Ben:** Yeah, no that, yeah. So what has Hatfield was talking about is the same stuff. It's over in Russia and the rocky areas over there, they source it. But no, that answers a lot because that's just something I know we really like to talk about micronutrients a lot. But in with regenerative farming, we're focusing a lot on the practices around raising livestock.

**Ben:** But I know that the whole component as well is the depletion of the ground minerals and how we used to be able to get some of that from those vegetables. And I just was wondering if you had any insight.

**Robb:** Yeah, I think leaning heavily on regenerative practices and then I do think interim to that. Some things like Mumi maybe could be a way to fill some of that gap. And then I,

my sense is also that leaning heavily on ocean derived plant and animal material is a really solid way to kind of plug some of those potential gaps.

**Ben:** Awesome. That answers it.

**Robb:** Thanks for hanging in there with us. We had all manner of-

**Nicki:** Technical difficulties.

**Robb:** Technical difficulty getting this thing fired back up, so thanks for hanging in there.

**Ben:** No problem. I appreciate what you guys do so it's no problem.

**Robb:** Awesome. Thanks man.

**Nicki:** Thanks Ben.

**Robb:** Take care.

**Ben:** Yep. See you.

**Robb:** Bye. Bye.

**Nicki:** All right, we have a caller from area code three O four area code three O four you're on the line. Please tell us your name, where you're calling from in your question please.

**Isaac:** Robb and Nicki, how are you doing? This is Isaac. I'm calling from Ohio.

**Robb:** Hey man.

**Nicki:** Hey man.

**Robb:** Great to get you.

**Isaac:** All right, so here's the deal. I beat the odds and I was selected for a very selective race, 100 Mile trail race out in California and last time I did it, I barely made my time goal. So this time I'm going to have to look for every optimization out there and I want to get it perfectly right.

**Isaac:** So the thing that's been on my mind is related to like supplements that may be could backfire and specifically thinking about resveratrol, vitamin C and then other interventions like ice water baths or yoga and Dr Gundry's book Plant Paradox even has me looking skeptically at plants now.

**Isaac:** So I'm wondering if you have any thoughts on spacing, endurance, exercise with certain supplements or whether there's no concern for any of the things that I've mentioned.

- Robb:** No, I think that you're really onto something there and we could maybe make the case that this is getting out to the last few percentage points in adaptation. But then again maybe not some of the studies that have been done looking at say like Potassium bicarbonate supplementation in and around say lactate producing exercise.
- Robb:** People will get a performance bump so long as they don't succumb to the gastric emptying deal of spewing out of both ends with that but the bicarbonates seems to blunt all of that kind of hormetic stress adaptation and we see a similar thing with vitamins in general, vitamin C and so it really it's interesting.
- Robb:** I've been listening to a lot of podcasts that's a little bit of a tangential thing. I will really try to pull this thing back in, but I've been listening to a lot of podcasts on just longevity in general, like work from Dr Michael Rose and he just makes this case that there might be some real specific supplements that we may be wanting to use once in a while similar to a pharmaceutical, but there's all manner of speculation around things like TA-65 elongating telomeres and different things like that.
- Robb:** Everybody was geeked out on, you need super high antioxidant intake because reactive oxygen species appear to be a co factor in the aging process. But then what we found is you ended up with immune down regulation and all this other stuff. And so I guess my point of that is figuring out a way to really optimally fuel your training and kind of periodizing that.
- Robb:** And so building your robotic base and then honing that edge you with a peaking cycle. And it's interesting even on the recovery side, and I've kind of thought about this and I've seen some stuff that suggests this, but Pavel Tsatsouline was just on Joe Rogan and he made the point that things like ice water baths, one, it can blunt the adaptation to exercise.
- Robb:** But then two, what was interesting is that it actually can encourage the body to rely on that process as part of the recovery. And so what actually ends up limiting the total kind of adaptive process that we could get. And if I were to default to anything, it would actually be sauna exposure. And I could make a case on two points for that.
- Robb:** One, heat shock proteins seem a lot better suited for dealing with the demands of exercise than cold shock proteins. Although there's certainly value to cold shock proteins without a doubt. But then there's also this opportunity to get a legitimate less than tricolor stretch training adaptation from that sauna session.
- Robb:** So I would and my sense is that post-training sauna does not downregulate that pulsatile inflammatory state. If anything, it enhances it. And again, there may be, could be an argument that perhaps we don't want to do that too often or too much. I'm not entirely sure about that. But I think that you're on some really good footing here questioning is ribs near trawl is a concentrated dose vitamin C really going to do you any favors in the context of trying to force a really powerful training adaptation for an event.

**Robb:** And then maybe during the event that's it. And clearly you have to do some tinkering with this ahead of time, but a buffered vitamin C with the bicarbonate mix that could buffer lactate and keep total pH within perhaps better operating parameters on game day that might be a really viable solution, but you're just going to perhaps test that over time and not really rely on it as training adaptation but more to know how to use it. And then do you exclusively use it on training on game day.

**Isaac:** Yeah. I mean that's, those are some excellent ideas. Especially I think the sauna is going to be really important for me. But I also like what you said about the periodization, because I think that's a mistake I've made in the past was doing the same thing too often. So I think mixing it up is probably a good approach.

**Robb:** Yeah. And I don't know if you followed Zach Bitter, but that guy is really smart on this stuff. And he will admit that there's a lot of individual variation, but some folks it's so much simpler. If it's like Zack Bitter is carnivore. And it's like he never eats plant material and it's like, well that's not really true.

**Robb:** He uses that in a really smart and sophisticated way to kind of goose a specific training adaptation. And then on these days where he's covering a hundred miles in a pretty quick pace. He's using targeted carbs now he's using a fraction, the amount of carbs that most people would use under similar circumstances but he is absolutely using carbs.

**Robb:** I don't remember him talking about some things like a buffered vitamin C or bicarbonates to try to deal with that side of kind of the metabolic acidosis. But he's operating at a really sophisticated level with that for sure.

**Isaac:** Well that's great. I really appreciate it. But let me get greedy and just ask one more follow up.

**Robb:** Lay it on me.

**Isaac:** And it's on a related note, what are your thoughts on Sulforaphane? Because it's another one of those, it's not a supplement. I'm getting it just from broccoli sprouts. But it's the sort of thing where I'm wondering could it blunt because it's supposedly a powerful antioxidant, may be doing similar things that resveratrol would. So do you have any specific thoughts about broccoli sprouts in Sulforaphane?

**Robb:** I'm confused on it to be honest because there's all this great correlative stuff that suggests it's healthy. Is that in the context of just kind of so much of what we see there, it might be preventing some of the deleterious effects of a poor diet and poor lifestyle. So what does that mean in the context of an elite athlete like yourself?

**Robb:** And I'm not entirely sure there. It's interesting. Anything that we call an antioxidant can be a pro oxidant under the right circumstances. So it's really a case of relativity there, whether like vitamin C or so many of these things statens function as antioxidants to some degree. So it's interesting what falls under that context of like antioxidant.

**Robb:** What also appears to be happening is some degree of that mito hormetic stress that's occurring with these plant materials. Man, I'm not entirely sure what the real deal is there. I mean it seems just the epidemiology would suggest that eating some cruciferous vegetables are generally a pretty good idea. Just this morning I had two people on Instagram messaging.

**Robb:** These were much shorter races, but a 5K and a 10K two separate people that, but they were like, "Hey man, I just had to tell you like listen to the Paul Saladino podcasts have been tinkering with carnivores and they both set and it's really intriguing now these are much shorter races than a hundred miles.

**Robb:** So that's a big deal. But that's really intriguing. It's fascinating to me because there's just a million different ways to tank your performance. You'd have a terrible night of sleep. You could go out and drink a bunch of booze, you could screw up your electrolytes and stuff like that.

**Robb:** But these folks have shifted, do what appears to be a largely carnivore intake. And like Sean Baker is kind of made the case if you're. So I guess if the story from the carnival or camp is true that the main benefit that vegetables provide is this mito hormetic stress. And then if you're training really hard, you're getting a mito hormetic stress there. Do you need anymore? And I don't know maybe not.

**Robb:** Maybe you want to save all of that adaptation for just dealing with the exercise and not necessarily plant toxicants. And that sounds like crazy talk, but it's plausible. I would put the likelihood maybe a little bit on the low side, but it's possible. And again, it's just intriguing that people are going from what is generally a pretty... They're eating clean, they're kind of paleo, maybe they're eating keto and then they pull out all plant materials and all of a sudden they get a PR.

**Robb:** And then I also know for sure there are folks at the flip side of that, that are not doing well with it. So it, and then that begs the question like how are they doing it? What other factors are in there. I do think that for these longer events, like what you were talking about, what Zach Bitter has competed in, there's probably a case to be made for doing things some sort of a starch or glucose polymer or something like that in that context. Awesome, man.

**Isaac:** Well, hey, thanks a lot. I really appreciate it. You've given me so much to consider and more generally, I think that you and Nicki help out so many people, so I'm just so grateful for the chance to say hello.

**Robb:** Hey man. Thank you.

**Nicki:** Thanks Isaac.

**Robb:** Take care.

**Isaac:** All right, take care. Bye.

**Robb:** Okay. Bye, bye.

**Nicki:** Okay. All right. We have a caller from eight one five. Welcome to The Healthy Rebellion Radio. Please tell us your name, where you're calling from and your question.

**Ben:** So yeah, my name's Ben. I'm from the Chicago land area and yeah, I had some questions, comments are about ketosis.

**Robb:** Lay it on me.

**Ben:** Okay. So I follow, I don't know if you've heard of a guy named Bart Kay, who he's part of the carnivore scene. And he has some, I mean he's pretty smart. You've spent some time in academia and he has some ideas about ketosis where he says that... He talks about ketosis... I think his hypothesis is that ketones are a secondary messenger for a hormone system and your endocrine functioning.

**Ben:** And his argument is that it's not a good idea to be in ketosis all the time. Granted he doesn't really find a level of ketosis that he's talking about and then kind of goes on this if you're doing carnivores, like especially like a version that's probably over a pound of meat a day and maybe with one meal a day you'd be doing basically kind of like a daily kind of keto cycling where you're going to be keto for a large part of the day and then-

**Robb:** Bump out due to the big meal.

**Ben:** The big meal. When you do that, when you eat all the protein then you're going to be gluconeogenic and then that's I guess kick you out of ketosis enough that it's not going to harm your metabolism or your thyroid. And I guess you want him to think that would kind of add to that.

**Ben:** My experience is, like a couple of weeks ago I was getting hardcore about measuring my ketones and glucose and a thing that was interesting is my ketones were never above like 0.12 but my glucose was always in like 80. I kind of expected that it would be like dipping lower than that. But it wasn't and...

**Robb:** I think I know what you're digging at. Let me jump in here and then you can save me if I'm bailing off of a cliff, but it's interesting. Ages ago, I mean the mid to late 90s Dr Michael Eades was recommending a low carb diet, not necessarily a super high fat diet. Now he wasn't afraid of fat, but he made the case ages ago that he would like to see the glucose that's used by the body primarily come as a consequence of gluconeogenesis out of the liver and mainly from dominating breaking down proteins because it was a super slow steady titration.

**Robb:** There's a super high nutrient density attached to it. There's a high thermic effect. And so what's interesting to me in some ways is in this story of carnivore versus keto or whatever a carnivore diet is it's effectively a low carbohydrate diet, but it doesn't necessarily mean that it's a low glycogen diet or low glycogen state because of the amount of protein folks are eating.

**Robb:** I think that we could see reasonable topping off of both muscle and liver glycogen, both from the fat and more specifically the protein. And it's really interesting and I honestly don't know what's the real deal is here. I definitely could see the case for transient ketosis being a favorable thing. I think that a little bit of pulsatile exposure to glucose either via kind of hepatic released glucose or some carbohydrate in the diet.

**Robb:** I can see some arguments from that from kind of like a hormetic stress response kind of perspective and it wouldn't require much to get that. And then there is just a lot of really interesting stuff around potential anti aging benefits of these secondary messengers effects that ketone bodies might play stack inhibition and stuff like that. So I have not followed Bart's work super specifically, but I'm familiar with kind of the broad brush strokes and I don't take issue with any of it.

**Robb:** I think that this, a lot of this stuff we really just don't know what the real deal is. And I think that it may boil down to some fairly unique individual considerations. But one thing that we've talked about on I think the standard podcast is when you look at what the recommendations are out of the Bernstein's Diabetes Solution. It's not specifically carnivores, but it's a high protein, moderate fat, low carb diet.

**Robb:** And what this is specifically designed for our folks with type one diabetes... And type one diabetes is so hard to manage because really the first activity of insulin when it's released out of the beta cells of the pancreas, arguably is to downregulate glucagon in the adjacent alpha cells of the pancreas. And the way that type one diabetics have to manage this is completely in a reverse order of sticking insulin in at the surface exterior level and then waiting for it to fuse and get activity at the internal level.

**Robb:** And so they are not really fans of a really high fat Keto diet per se because it induces potentially physiological insulin resistance and people in it and it makes that management to blood glucose levels and the management of insulin boluses more challenging than a high protein, low carb, moderate fat intake, which looks really in a lot of ways a lot more like a carnivore approach.

**Robb:** When you get right down to it. So it makes sense to me to be more on that side of things. And then some of the early work that Loren Cordain did, one of his early papers, Paleo contemporary diet made from paleo food sources where he basically does a perspective to date 2000 calorie plan and it was for a woman and it was around 2100 calories a day, but it was over 200 grams of protein for a medium size female.

**Robb:** And then it was maybe like 150 grams of carbs and then, I don't know, 7,500 grams fat, something like that. But it was really high protein and so a lot of this stuff that I've seen that comes out of the Keto games world, the Bernstein's Diabetes Solution, the people that seem to be succeeding on carnivore and also kind of that Loren Cordain perspective on paleo.

**Robb:** I just see a lot of similarities there. Mainly just this really powerful emphasis on protein. And then I think that we individually have to get in and do some tinkering, kind of figure out do I do okay with some plant material, do I have some gut issues that doesn't really

allow for that. And then we've got some playing to deal with after that kind of kernel of like a very protein centric approach makes a ton of sense to me.

**Ben:** Yeah. I guess the other thing I would say is I kind of wonder if there is if the keto diet is kind of a myth in the sense of at least when I first started learning about it, I had the sense like when you're in a keto diet that means okay, my brain is being entirely told by ketose and then, so it was an interesting kind of happenstance that like when I'm kind of measuring the ketones, it's like they're like in this middle range, they're not that high.

**Ben:** And then I kind of was interested in seeing well how does that amount of ketones compare to glucose? And what's interesting is I guess a level of 80 what is it like milligrams per deciliter of glucose is around the ballpark of like 4.5 millimole per liter. So even when you're decently ketonic you still have-

**Robb:** A fair amount of glucose.

**Ben:** Three or maybe even four times as much glucose hanging around. So I, and maybe that's just the thing is like the Keto gains approach, which seems to work for me that's maybe not down-regulating things that you could still feel good on and do it sustainably just actually isn't really that much of a keto diet. And so whatever kind of secondary hormonal effect maybe there is a ketones is not really happening as far as down-regulating ...

**Robb:** Yeah, man it's really interesting these things with potential thyroid downregulation and stuff like that. I do think that a decent whack of protein is going to produce enough of an insulin response that maybe that keeps you out of that thyroid down-regulated state. Maybe you don't need specifically a bolus of carbs to do it, particularly if you're eating something like beef or even Whitefish, which can produce a really remarkable insulin release.

**Robb:** And so maybe that is part of the reason why we're not seeing that that keto gains seen just crumbling. It's mainly females and we're not seeing a ton of HPA axis dysregulation or thyroid or hair falling out and stuff like that. They seem to be motoring along really well.

**Robb:** So it is interesting. There's just some fascinating stuff on there. I forget who it was. Somebody recently was looking at the total energetic pool, which you just kind of alluded to of maybe about four to five millimolar glucose and then if we can get, usually ketone bodies are not remotely that high. They're people that are keto adapted. Actually we're lucky if we get a much up over one, 1.5-

**Ben:** Oh, you know what, I have a question. So yeah, some of that I have been wondering and I couldn't find a quick answer on the internet part is like, okay, so how many, I mean I guess it depends on what level of ketosis you're at, but how many calories of ketones are you making in a day? Because I remember I used to be under the impression like, Oh you know, if I do like a shot of MCT oil, that's like all getting converted into ketones. But I don't think... It doesn't seem to work like that.

**Robb:** Marty Kendall did a piece on this re I think it was Marty where it, and he's had just an interesting look on this. Basically making the case that somebody that's metabolically flexible and metabolically healthy at rest they have a comparatively low amount of circulating energy and that makes sense. You don't need a lot of glucose, you don't need a lot of triglycerides, you don't necessarily need a whole ton of ketone bodies.

**Robb:** You need enough but don't need a ton. And what we see on the flip side of people that are metabolically broken or heading into metabolic syndrome, they've got high glucose, they've got high triglycerides, the lifeboat proteins go up. And in really extreme cases we end up in a scenario in which we have ketoacidosis too. So we're like drowning in energy in these situations of people with really poorly managed metabolic scenarios.

**Robb:** Now, and he did do some breakdown on the total energetic, not load, but I guess consequences of say like a given ketone level of in general MCTs is just kind of backing up a little bit. In general, my understanding is that MCTs do predominantly convert to ketone bodies. It is interesting on the brain metabolism side, it was only recently that they discovered that some medium chain fats, medium chain triglycerides can fuel the brain directly.

**Robb:** So the brain isn't only glucose or glucose and ketones like there's some medium chain fats in there and I don't know that anybody's really been looking at this, but under a more ketogenic scenario is the brain able to use longer chain fats? I don't know, but it was a surprise that it could use medium chain triglycerides.

**Robb:** So I wouldn't be shocked if we had another surprise that there's some utilization of longer chain fats in addition to the ketone body. Interesting thing is the production of ketones is kind of thermodynamically inefficient. There's an energy loss in that whole story. And so biology wouldn't be super stoked about that. It's great on the one hand from kind of a potential fat loss perspective, although you're talking about maybe 25, 50 calories a day. I mean if you miscalculate your handful of almonds, you just screwed that quote metabolic advantage up.

**Ben:** Hold on I wonder though, I mean is the conversion of the MCT into beta hydroxy iterate? Is that actually that much more energy costly than like a longer chain fatty acid that going through everything to get converted into acetol COA. I mean take one more step.

**Robb:** It's a little bit more energetically costly and it's both good and bad because you're popping out of the NADH part of this story and relying more on the FADH part of the story. You're pulling things away from going through the mitochondrial complexes one, three and five.

**Robb:** They're more mitochondrial complex too, which has a lower oxidative stress but interestingly is a little bit more energetically demanding. So, and again at the end of the day, I don't know how much any of that matters in the big picture, but it's interesting stuff for sure.

**Ben:** Yeah, you definitely hear a lot of, I mean at least when I was first getting into this stuff, you get sold on this idea fat it burned so much cleaner. You almost get this visual, if you don't know Biochem that literally like the electrons or whatever the hell is getting stripped directly off the fat.

**Ben:** But at the end of the day it's just like a Acetyl-CoA really. And you kind of like DC whatever differences that there are just marginal or really just marginal and but it adds up I guess on a big scale

**Robb:** It could. Nicky's going to cut us off here because we're getting long winded but couple of quick thoughts. So it is just that clearly for at least some people, a low carb or ketogenic approach, whether carnivores or whatever. It just offers some really remarkable appetite control, you're just not hungry in the same way that you were on kind of a mixed diet.

**Robb:** And that's a huge win. And I would say that 90, 95% of the benefit is there. When we look at longevity research in animals, most of the benefit of calorie restriction seems to just be that they're being protected from a super shitty lab, chow based diet. And when animals are fed a species appropriate diet, you don't really see much benefit, but it may be even detriment for a species appropriate diet.

**Robb:** So I, if we figure out a way to just not succumb to overeating in the modern industrial world, and I think that's like 90 or 95% of the fight and then from there, this 5% of do we have H stack inhibition? Do we have lower oxidative stress? There might be truth to that, but I think all of that takes kind of second seat to just the fact that we're not overeating.

**Nicki:** Thanks Ben for your call.

**Robb:** Nicki is doing the big hook-

**Ben:** Thanks for answering my call.

**Robb:** -and yanking us out of here.

**Nicki:** Thanks so much.

**Robb:** Take care man.

**Ben:** Thank you, you too.

**Robb:** Bye, bye.

**Ben:** Bye

**Nicki:** Welcome to The Healthy Rebellion Radio. Can you tell us your name and where you're calling from and your question?

**Zach:** Hey, it's Zach from Reno. Missed you guys.

**Nicki:** Hey Zach. How are you doing?

**Zach:** Doing great. How are you doing?

**Robb:** Good.

**Nicki:** Great. What can we answer for you today?

**Zach:** Okay. Can you hear me okay? I'm kind of outside right now.

**Nicki:** Yeah.

**Robb:** You're coming through? Yep.

**Zach:** Okay, cool. First off, I just want to thank you for that interview do with a doctor Saladino, did I pronounce that right?

**Robb:** Yep.

**Zach:** Yeah, I didn't know the damn, I mean like your other books, you've kind of talked about your struggles, but hearing the full extent, I was like, Oh man, I make a lot of excuses. So I really appreciate you leading by example and being transparent about all that.

**Robb:** Thank you.

**Zach:** Basically my question is I have a lot of behaviors I've used over the years to varying degrees of being unhelpful. So like when we put one behavior and we do kind of this stereotypical cross eviction type thing where we use another behavior. I'm kind of curious as to what methods you use outside of working on mindset, movement, sleep, wake cycle, like all the general things.

**Zach:** Have you guys gone down the amino acid rabbit hole? It's like brain support or have you seen other ways of trying to change multiple behaviors at the same time?

**Robb:** Man, I've done a fair amount of tinkering with the amino acid story. I personally haven't had great success with it. A good friend of mine, Dr Ben Bolser leans heavily on that and but also it's in the context of kind of appropriate glycaemic load, paleo West type diet. And so I think that for some people doing DL phenol alanine can really dramatically increase dopamine levels in either depression or chronic pain.

**Robb:** It can really help with that. But on facilitating that behavior change. And it's a really interesting thing going from one kind of addictive behavior to another within CrossFit,

and this isn't beating up on CrossFit, but within CrossFit there are a remarkable number of former addicts from alcohol to harder drugs. And you could make the case that they kind of supplanted one addiction with another.

**Robb:** And then depending on to what degree CrossFit takes over their life, it may take on some maladaptive characteristics. But I guess I'm a little bit sanguine on that in the... I think that so long as we figure out something that seems like a better option than maybe that's a good idea.

**Robb:** But I did in my youth, I lived literally next door to a methadone clinic and those folks would chain smoke and eat Twinkies like their life depended on it and I don't it clearly compared to heroin. Maybe they've got a longer run on the Twinkie and cigarette diet than they were on the black tar heroin diet.

**Robb:** But at the same time that's going to have an expiration date on it too. So man, I don't know as far as it is definitely outside my wheelhouse on that. That definitely gets into the addiction counseling and stuff like that, which I am not even remotely well steeped in. But again, I guess circling back to your original question, I've tinkered with some of the amino acid stuff, recommending things like tyrosine or tryptophan at various points and they I haven't seen it work miracles for me.

**Robb:** But again, I'm also not at an exceptionally well schooled in the protocols on that stuff. I do know some people really, they profess some really remarkable successes with that. But I think beyond addressing sleep quality and things like that. It's hard to beat those elements and then even some things like some degree of sleep deprivation that feeds into consolidating sleep into a more sleep efficient period.

**Robb:** They've used that for some bipolar disorder and some depression. So I think tweaking the levers of circadian biology, sleep and food in my opinion are probably more powerful tools or that shows the confirmation bias of my limited experience on that.

**Zach:** Yeah, no, I appreciate that. It sounds funny but I mean even having read about this stuff for over 10 years, it took me until last year to accept how bad my sleep has been. For literally decades. How a natural extent and going through some really good, well reputable, clean books and how it talks about kind of what you were just saying, how having that chronic sleep deprivation can impact decision making and all these other things.

**Zach:** Your brain is basically damaged to varying levels on a daily basis. So, okay. I appreciate that feedback and I really appreciate the healthy rebellion. So thank you very much.

**Robb:** Awesome man.

**Nicki:** Thanks Zach.

**Robb:** Take care. And we miss all of our peeps in Reno.

**Nicki:** Yeah, take care.

**Zach:** Yeah, you too. I missed being crushed by you a regular bases.

**Robb:** Well, we'll see you at a Spring Camp. Take care, man.

**Zach:** Awesome, thanks brother. Have a good day. Bye.

**Nicki:** All right. Our final question this week is in written format and it's from Nate on the dangers of Stevia. He says, "Hi Robb and Nicki. Huge fan of the show and format. Do you see any dangers in consuming pure Stevia powder or liquid other than the obvious danger of it potentially making you crave more sweeter foods?"

**Nicki:** Have you read about any credible downsides to it that would concern you? I love the stuff. It helps me on my keto diet and I just want to make sure it's cool to keep consuming in moderation. About a quarter to a half teaspoon, maybe a day. Thanks again for being an unbiased source of truth in this crazy landscape.

**Robb:** Well, I don't know if I'm unbiased. Everybody has a bias. I appreciate the vote of confidence. Hopefully my bias being steeped in evolutionary biology and a little bit of biochemistry and stuff. Hopefully that gives us a half decent place to at least start the conversation around.

**Robb:** But the stevia and sweetener topic, it's funny, particularly within fasting circles, people will see Stevia say in the element product that we have and they freak out and they're like, it stops your blancher fast. And I'm like, via what mechanism?

**Robb:** And then there's radio silence and then I'm a big mean person because I'm being a scientific or whatever, I don't even know. But so people will make cases around, well you release insulin and I think in some people under some circumstances, typically in an overfed state, stevia could pose a problem because it's an additional sweetening agent.

**Robb:** But the interesting thing with it is it lowers blood sugar, which they usually hold up as being a laudable thing. But that is because it gooses a little release of insulin, but it's not a really huge amount under the conditions of keto and fasting. It is trivial, non-significant, or maybe even beneficial because you're actually scooting a little bit of blood glucose into storage and then you're going to burn fat and produce ketones more.

**Robb:** So even on that whole autophagy side, I've been digging around and there's not a ton of material around this, but stevia, like, like most plant materials seems to enhance certain degrees of autophagy. So again, in the, what was his name?

**Nicki:** Nate.

**Robb:** Nate, hit the nail on the head, the real concern around any type of modified sweetener flavoring in something like chicharrones, if they're plain, you'll have one or two and you're good. If they have like-

**Nicki:** Barbecue flavor.

**Robb:** Barbecue flavor then you'll have one or two bags. And so that's where we get into hazards mainly with these different flavors and sweeteners and stuff.

**Nicki:** Making it hyper palatable and-

**Robb:** Making it hyper palatable. People get all wrapped around the axle of, well, it's got a little bit of monosodium glutamate or this or that, either the other. And it's like that's really not the issue generally other than maybe some very sensitive people.

**Robb:** But the issue is when we tweak things in such a way that we can easily overeat them. We were messing around with a couple of different chocolate bar variations and they're pretty good. They're mainly stevia sweetened and then we found this one and Oh my God, it's like amazing.

**Nicki:** Yeah, it was like a zero. It was like a sugar free chocolate bar, but it also had almonds in it and I saw that it changes the palette.

**Robb:** Just the mouth feel though, and like man, it tastes like chocolate. And this is something where normally the standard like stevia sweetened chocolate bars-

**Nicki:** 80% chocolate.

**Robb:** We'll eat a piece or two and it's no big deal. But we would through the course of a day, smash.

**Nicki:** The entire bar.

**Robb:** At least one bar, maybe more if it was around.

**Nicki:** So we had to stop buying those.

**Robb:** Just don't last that much. Yeah. Those are examples. But the problem is the hyper palatability thing that occurs, in my opinion, not necessarily that these specific sweeteners are in and of themselves problematic.

**Nicki:** Awesome. Thanks for the great question, Nate. All right, that's a wrap. And then thank you for joining us. Make sure to check out our show sponsor Perfect Keto for all your keto needs. You can go to [perfectketo.com/rebellion10](https://perfectketo.com/rebellion10) and use code REBELLION10 for \$10 off your order of \$40 or more. Please-

**Robb:** Share this episode.

**Nicki:** Share this episode.

**Robb:** If you enjoy it. If you find it helpful-

**Nicki:** You can help us.

**Robb:** Share this thing around.

**Nicki:** Reach our mission of getting a million people out of the sick care system by spreading this podcast. We are doing all that we can to get the message of health out there in regenerative agriculture and the fact that we have power over how we feel and how our bodies are.

**Robb:** It's profound in its profundity, but seriously that we've had solid growth, but to reach this goal of getting a million people out of the sick care system, we need y'all's help and the feedback that we get is that the show's awesome. We produce good content. It's super helpful, but we need to start sharing this out to the masses and clearly the show isn't going to be a perfect fit for everybody, but if somebody has-

**Nicki:** Especially with you F-bomb.

**Robb:** Particularly with my F-bombs.

**Nicki:** Tendency.

**Robb:** But if you know somebody that is struggling and they have a certain health issue or a certain question, it's a pretty good chance that we've covered it at some point in either this show or a previous show. So please do share that stuff around. Sign up for this subscription.

**Nicki:** And if you want to join us in the healthy rebellion community where I guess when this show airs, we're just wrapping up our first 30 day reset and 7 day carb test.

**Robb:** Which has gone amazing.

**Nicki:** We couldn't be happier. People are making some great strides, breakthroughs. We've had mindset coaches come in where it's been a really, really special experience. So we're looking to do more stuff like that. But this just the community in general, it's a really amazing place and we've got some great people and we'd love to have you as well. So you can go to [join.thehealthyrebellion.com](http://join.thehealthyrebellion.com) and we'll see you in there.

**Robb:** Awesome. Thank you wife.

**Nicki:** Thanks hubs.

**Robb:** See y'all soon.