

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

**Robb:** Are we testing or is this real?

**Nicki:** No this is IRL.

**Robb:** IRL. In real life? Awesome.

**Nicki:** In real life recording. Yes.

**Robb:** Welcome everybody to another addition of the show.

**Nicki:** Of the Healthy Rebellion Radio.

**Robb:** That one.

**Nicki:** Hope everyone is having a good week. It's been an interesting week with both CrossFit and Paleo f(x) in the news.

**Robb:** Like bugs into windshields as it were.

**Nicki:** As it were. Yeah.

**Robb:** What do you want to say about those?

**Nicki:** Ah. I think the ... well, we've had some conversations about specifically what happened with Paleo f(x) and for those that don't know, Keith Norris did a post on Facebook that was pretty out there.

**Robb:** It was kind of out there.

**Nicki:** I think he ...

**Robb:** It ventured into some conspiracy theory land around COVID and George Floyd and I-

**Nicki:** And breath work.

**Robb:** Some breath work. And here's the deal for me. I've known Keith for a long time. There was no malice or ill intent in that thing, in my opinion. And I'll probably get mobbed for even saying that. But I don't think there was malice or ill intent. But it was a huge fuck up. Like it just ... it ...

**Nicki:** And several people have withdrawn from presenting at Paleo f(x) and Robb, even you have decided not to. I mean, Paleo f(x) was struggling anyway because of COVID-

**Robb:** COVID and-

**Nicki:** ... and not being able to host this event this year. And so it was already in a pretty precarious situation. But I think the thing that was most concerning about this was the number of DMs from people that you didn't even know on Instagram. Basically asking you to go and help dig the shiv into Keith.

**Robb:** Yeah. And you know-

**Nicki:** I mean-

**Robb:** ... and just circling back to CrossFit. When we got kicked out of CrossFit, and it's interesting. Greg Glassman and I talk every once in a while now. We have an okay relationship. There's a lot of water under the bridge. But when that Black Box Summit went down, he called upon everybody to make a show of fealty and some people tried to burn us at the stake publicly. And other people were actually brave and stood by us. And we really learned who our friends were. But having tens of thousands of people mob you, we've actually had that before. And it fucking sucks. So-

**Nicki:** And people are more than happy to sit behind their computer and read one thing that a person wrote and then instantly discount everything else that they've contributed. And-

**Robb:** Which is so ironic, because we're supposed to be evolving. And where is this whole notion of like forgiveness? And like the punishment being commiserate to the crime. Keith fucked up. There's no two ways around it. But you've got to really look hard in that thing to find malice. And I'm sure somebody will. The fact that he wasn't towing some sort of party line and that's maliceful right there and he's a horrible human being. I didn't see malice in it, he fucked up. Greg Glassman stuff, there's some malice there. Again, Greg and I have an okay working relationship at this point. But he's been a controversial figure for a long time and has-

**Nicki:** That's putting it nicely.

**Robb:** ... poked the bear innumerable times. And the aperture for his ability to get away with shit like that closed. And the interesting thing there, too, is the doxxing that occurred. There are really people with real gyms that their livelihood. They're feeding their kids. Putting ... and this is in an environment where these gyms have already probably been closed at least a couple of months, and are in all likelihood in kind of dodgy financial straits. But there just seem to be absolutely no thought about like well, let's let these

people sort it out. Just to your point, the rallying cry around the need to just put as many heads on as many pikes as possible was incredible, and if we keep doing this to each other with this like righteous indignation where we assume that we're 100% fucking right, then all of the heads are going to end up on a pike.

**Nicki:** All of ours. Everybody's. Everybody's.

**Robb:** This is where it goes.

**Nicki:** And it's like ... Yeah.

**Robb:** This is where it goes. So ...

**Nicki:** Super ugly. And it just felt like this ugly peer pressure bullying. Like ... I don't know. We've talked about it a little bit. But it's scary. Like honestly, it makes me afraid for what our country is becoming.

**Robb:** Do I mention obliquely my recent sacred cow update of support?

**Nicki:** I don't know if we want to go into that right now.

**Robb:** Okay. Maybe some day I'll talk about that.

**Nicki:** Maybe we'll talk about it another day. But there's just a lot happening in the background with people essentially bullying.

**Robb:** Yeah.

**Nicki:** So ...

**Robb:** So anyway, I don't know that y'all came here for that, but I guess that's one of the salty talks.

**Nicki:** Yeah. That was just a little ... this isn't a salty talk. Sorry.

**Robb:** No this one's not....

**Nicki:** Not salty. But maybe we can open that can of worms in another ... an actual salty talk.

**Robb:** Okay.

**Nicki:** Gosh. I guess on the COVID front, one of our Healthy Rebellion members posted something that just sort of gutted both of us this morning. She has a friend that works in neonatal intensive care units and she's talking about how there are babies who are months old who have not seen a human face because all of these nurses have to be masked and six feet apart even when they're feeding these babies. Their moms can't

even go in because of coronavirus. And she was just commenting that like this is like a giant experiment on human infants.

**Robb:** It's well understood that primates of all types, if they don't experience significant physical contact and the-

**Nicki:** Facial expressions.

**Robb:** ... facial recognition and all that, that it damages the individual forever. And that's true whether we're talking about a rhesus monkey or a human. And again, we were early in this scene of saying, "Hey. We need to pump the brakes. There's some concerning features here." I would say we were also reasonably early in the scene in saying, "Hey. Maybe we're going a little bit overboard." And this is, again, amidst all of this, this kind of super reactionary cancel culture stuff. Nobody seems to recognize that okay, we don't want people to die from COVID. No fucking shit. Like check. Got it. But there are consequences to every decision we make. If you're a real fast-twitch, you're not going to be a super good endurance athlete. If you're a great endurance athlete, you're probably not going to dunk. And there's just kind of pluses and minuses or trade-offs to everything.

**Robb:** And if we have this kind of over-the-top response to the coronavirus that really is not supported by science-

**Nicki:** The data that's coming out.

**Robb:** ... then the knock-on effects of this are going to be catastrophic. And in this case, we won't see it for a few years. Before this crop of kids, we see the emotional and behavioral issues that these kids have, and these families have. Because of this type of treatment in a population that is well-understood to not really get the SARS-CoV-2 virus. So, yeah. It's just-

**Nicki:** I don't know. It's just one other thing. And it's something that unless you have a child in NICU, which we don't, it didn't even cross my mind. But when she brought this up about her friend and having to be six feet apart and where masks even when feeding premature infants and it just ... it's one of these things that there's so many things out here probably like this that we're not ... most of us don't think about because it doesn't affect your day-to-day life, but when you really look at it, it's like this is going to have an incredibly damaging impact on a lot of these little ones.

**Robb:** So again, we're not like anybody's moral compass but I'm just kind of throwing it out there that-

**Nicki:** It's good to start questioning stuff, though.

**Robb:** And the question to ask is, the additional question that I think doesn't get asked enough: what are the unintended consequences here? How could this have knock-on effects? And when we start becoming aware of those knock-on effects, can we be nimble

enough to readjust our position on things so that we don't just drive this all off a cliff.  
So ...

**Nicki:** Right. Okay.

**Robb:** Aren't we like shining rays of fucking happiness today?

**Nicki:** Tell us about our news topic today.

**Robb:** News topic de jour is an article at Nature and it's pretty cool. It's a massive study that looked at all-cause mortality and total cholesterol levels. And what was interesting is we saw a pronounced U-curve. And the low end of the U-curve with the lowest all-cause mortality both male and female, although, females have a slight shift relative to males, was about 200 nanograms per deciliter on the, I believe, it was the total cholesterol on that. And so which is fairly high. It's considered to be relatively high. It's interesting. It's a little bit like sodium in that the two little cholesterol was much steeper like it was much more dangerous, much more hazardous to have low cholesterol than having higher cholesterol. There is a caveat to this.

**Robb:** We could be seeing an artifact in which people with low cholesterol have other disease processes which are making the cholesterol low.

**Nicki:** Gotcha.

**Robb:** So that's a thing that needs to be considered. This thing isn't like carte blanche. Like the higher your cholesterol the better things are. But out there in vegan land, it is definitely put forward that there's like this linear relationship with cholesterol and cardiovascular disease and all cause mortality, and that is a lie. It is a patent lie. There may be more nuance to it, like there was for a number of years, a study suggested that just because people were overweight, it didn't necessarily mean that they would have a shorter lifespan. When they got in and really started teasing out the details on this, many, many people who are underweight which skewed the data in one direction are sick. They have cancer or HIV or different wasting diseases.

**Robb:** And so when they adjusted for the potential the disease was causing a lower body weight than that. That benefit of overweight actually conferring a longevity benefit was gone. And so again, this is something to look at and use as a data point. It's not a biblical feature unto itself. But it's really interesting and again-

**Nicki:** 12.8 million adults-

**Robb:** Adults. Yeah. It's a massive study.

**Nicki:** ... were in this study. So yep.

**Robb:** Yeah. Yeah. Yeah.

**Nicki:** Cool. And we will link to that in the show notes.

**Robb:** It is epidemiological in nature but we're not looking at food frequency questionnaires. We have a couple of good points of information and their cholesterol levels. When they died and what they died from. So yeah.

**Nicki:** Okay. All right. You're going to like this iTunes review, babe. It's from Nick\_Reardon. And let me see if I can read it to best effect. It says, "Holy cats. What a show. Looking for a podcast about health and nutrition? One with a name to help as its mission? Look no further for the Healthy Rebellion is the one. Somehow they can make talking about poo seem fun. Topics like exercise, keto and carnivore. Power lifting anti-aging sustainability and more. You'll have some fun and do some learning too. So click subscribe and listen. Yes. I'm talking to you."

**Nicki:** Nick, that was so awesome.

**Robb:** Nick needs like a lifetime supply of LMNT for that.

**Nicki:** I know. We need to send him like a sweatshirt or something instead of t-shirt. Thanks, Nick. Send us an e-mail to [hello@robbwolf.com](mailto:hello@robbwolf.com) with your t-shirt size and your mailing address and we'll ship you out one of our shirts. And thank you.

**Robb:** Should we make our standard in the future that we have kind of a Dr.Suess-esque rhyming thing? Otherwise you're not even in contention.

**Nicki:** So far, out of all of the reviews, I think Nick has ... he has the trophy.

**Robb:** Well, this is ... Yeah.

**Nicki:** We're less than a year into this show, but yeah. This episode of the Healthy Rebellion radio is sponsored by Four Sigmatic, the makers of the incredibly popular mushroom coffee with chaga and lion's mane. Your go-to morning beverage to support productivity, focus and creativity. Four Sigmatic has a whole suite of yummy mushroom products and ways to incorporate health boosting mushrooms into your daily routine. They have coffees, matchas, cocoas, mushroom elixir mixes and products with caffeine and without caffeine. And my personal favorite which you should absolutely try is Think, their lions mane elixir mix. If you're in a need of a productivity boost, if you want something to help with creativity and focus, check out Four Sigmatic at [foursigmatic.com/rebel](https://foursigmatic.com/rebel) and use code REBEL for 15% off.

**Nicki:** So hubs, today's episode is a guest interview that you did inside the Healthy Rebellion community with Dr. Gabrielle Lyon. And we had several Healthy Rebellion member submitted questions on topics ranging from mTOR and protein levels and very low carb and premenopause. And it was a great interview. I think it was one of the most popular ones that we've done inside the Healthy Rebellion.

**Robb:** Yeah. Super cool. I met Gabrielle years ago at a naval special warfare event. Her husband is retired SEAL who is now going to medical school. And she's just amazing. And it's kind of cool. As a research background, she was in the same lab as Layne Norton and it's fascinating to see the different approaches to the world even though they had the same PI and the same very similar academic process. But she definitely embraces this ancestral health template. She lays out some really strong recommendations for focusing on protein. Like make protein your goal. And then whether or not you have a little ... more carbs or more fat to kind of fill things out.

**Robb:** We can get to that pretty easily. But if we aren't on point with the protein, nothing really works. And it's just an uphill slog the whole time otherwise. And she's just brilliant with this stuff. She has been a competitive athlete. A figure competitor. Published in research and then a great functional medicine doctor, too.

**Nicki:** Awesome. Let's jump into the interview.

**Robb:** Great.

**Robb:** Hey, hey. How are you?

**Dr. Lyon:** Hi. How's it going?

**Robb:** Good. What's new and exciting?

**Dr. Lyon:** Got a babysitter for me?

**Robb:** No. We're down several on that ourselves. So I am no help on the babysitter thing.

**Dr. Lyon:** Yeah? So you survived the tornado, which I'm very excited about.

**Robb:** We did. We did. I'm happy about that. The vegans are probably not happy that I survived the tornado but they can't win everything. So ...

**Dr. Lyon:** Oh, that's okay. And arguably they'll never be happy about anything.

**Robb:** About anything. Yes. Yes. Until the world ends. Then they'll be happy. Yeah.

**Dr. Lyon:** Correct. Can you hear me okay?

**Robb:** You're coming through just a smidge choppy. But ...

**Dr. Lyon:** I wonder why.

**Robb:** Are you hardwired in by chance?

**Dr. Lyon:** Uh-huh (affirmative).

**Robb:** You are. Interesting. Okay. Maybe it's just the general burden on the Interwebs because everybody's on house arrest. So we'll just motor through the best we can.

**Dr. Lyon:** It's not really slow like that. Let me ... I'm on 5G. Yeah. I mean, I could switch to headset if you want. But ...

**Robb:** No. It seems like it's a little bit just like the data transmission. Like a ... I'm hardwired in ethernet-wise, so that tends to-

**Dr. Lyon:** Got it.

**Robb:** ... solidify things a little bit. Yeah. But we can just run with it and we'll get what we get. So ...

**Dr. Lyon:** Yeah.

**Robb:** Hey, doc. Remind me. Did we meet at a naval special warfare event or at a SEALFIT event?

**Dr. Lyon:** Gosh.

**Robb:** Because we both had overlap in both of those scenes.

**Dr. Lyon:** Yeah.

**Robb:** I want to say it was a SEALFIT event but I don't remember 100%.

**Dr. Lyon:** Probably. I mean, probably.

**Robb:** Mm-hmm (affirmative).

**Dr. Lyon:** I think ... I mean, it was at least six years ago.

**Robb:** Right. Right. Yeah.

**Dr. Lyon:** It was probably around six years ago.

**Robb:** Yep.

**Dr. Lyon:** Which is crazy.

**Robb:** Now, how long have you been a practicing physician at this point?

**Dr. Lyon:** So I have had a private practice for five years. But I've been in practice for over 10.

**Robb:** Okay.



**Dr. Lyon:** For about 10.

**Robb:** Gotcha. Gotcha.

**Dr. Lyon:** And that includes an N-C in fellowship. But I would consider that practicing.

**Robb:** Right. Absolutely. Yes. Yes. Absolutely. So you have a pretty phenomenal background in fitness, in strength and conditioning. One of the most common questions that I get these days just pertains to career path. Like people are ...

**Dr. Lyon:** Yeah.

**Robb:** Maybe they're an engineer or they're doing whatever and then they have a health transformation. They're like, "I want to do something in this space", and then they're like, "Should I be a doctor? Should I be a physician assistant? Should I be a health coach?" What drew you to medicine? Because I have to admit, when I pulled the plug on heading down the medical school route, for a while I was like, "Man, anybody that wants to be a doctor needs their head checked." It just seemed like a really tough thing. Not just the schooling part but like everything afterwards. All the paperwork and the legality and everything. What about it drew you to it? And then has it met your expectations? Would you change gears now if you could wave a magic wand?

**Dr. Lyon:** Yeah. These are really great questions and I feel so fortunate that you're asking them because I typically don't get asked those questions. But privately I get asked career questions all the time. And, you know, I had an interesting journey because from a typical physician being as my professional training from medical school through two residencies in [inaudible] years. And that's a really, really long route to go. You know?

**Robb:** Right.

**Dr. Lyon:** And initially, so I am second generation functional medicine. And my godmother Ms. Liz Lipsky. And she wrote digestive wellness back in the day. She was one of the OGs of functional medicine. And so I moved in with her when I graduated high school early. And I moved in with her when I was 17. And learned all about nutrition. And that's really where everything started. So after that point, I knew that nutrition was the way I was going to go. So, originally it wasn't medicine. It was really nutritional sciences. And then I actually had a tornado fallout. I was at University of Illinois training under Dr. Don Layman. And there was a tornado. We all had to go in the fallout shelters and be there for freaking ever and it was like at that moment, I thought to myself, "Man. How can I contribute more? There's got to be more than an apple a day." It's for your health.

**Dr. Lyon:** And I think that at that moment is when the medical trajectory started. Truthfully, I hated all of it. There was a lot ... because I had come from a different perspective, I actually hated all of medical school.

**Robb:** Gotcha.

**Dr. Lyon:** It wasn't-

**Robb:** It was just something you had to get through.

**Dr. Lyon:** Yeah. And you asked the question, would I have done it again? Yes. Because I do think that there's something very important about actually being trained, well-trained, and trained by experts. I think that there's validity in that.

**Robb:** Makes total sense. Doc, again, you have a really interesting background above and beyond the physician component. But when we first met, it kind of surprised me. You were both incredibly knowledgeable and geeked out on the ketogenic diet and things like that. And again, this was like six going on 10 years ago. And it just wasn't-

**Dr. Lyon:** It's so long ago. Yeah.

**Robb:** It wasn't the hot topic it is today. You know? It was still kind of fringy. It was almost like you had a little bit embarrassed about like oh yeah, I eat keto. What got that onto your radar and there's a lot of questions around ketogenic diets, lower carb diets for women in particular. Like how have you navigated that and why do you feel like some folks have some problems? Like what are some of the things maybe being missed in that equation?

**Dr. Lyon:** And I'm going to give you my anecdotal perspective. And certainly the perspective from my training. So I trained under a Dr. Donald Layman. And he is really in ... one of the godfathers of protein metabolism and Layne Norton was in the lab. So it was a very particular kind of training. And the perception that optimizing protein intake was at the core of Layman's lab. And it wasn't necessarily, and I would say probably back in that day people often confused optimal protein diet with a ketogenic diet because it was, like you said, kind of the fringe.

**Dr. Lyon:** But really I would say more than a ketogenic diet and I will [inaudible] my experience with a ketogenic diet, was optimizing protein metabolism. And really optimizing protein. Anchoring nutrition and protein for the preferential effects that it has on body composition. And that's really where the perspective started. And I just think because of my experience in sport and being really interested in body composition, it was all about protein for me.

**Robb:** Right. Right. And you know what's interesting? When you look at some of Loren Cordain's early stuff. Like he had a paper. It was basically constructing a paleo diet, paleo type diet with the best modern foods that you could get, and it was supposed to be geared for like a medium sized female. And the recommendation was like 212 grams of protein a day which was pretty huge. And is still pretty huge. And within kind of ketogenic diet circles, a lot of people would freak out about that because of gluconeogenesis and all this type of stuff. Like where are you in that kind of optimum protein spectrum? What are maybe a lower bound and then kind of an upper bound. And I know it depends a lot. Like we have some great studies that suggest that if you're in an overfed state, you're better off to be overfed on protein than anything else. Like there's a lot of nuance there.

**Dr. Lyon:** Yeah. It is super interesting. So you're obviously totally correct in saying that higher amounts of protein will go through the process of gluconeogenesis and generate more carbohydrates. For every 100 grams of dietary protein the body will generate 60 grams of carbohydrates. So and that's through gluconeogenesis. So it's pretty specific in terms of the numbers. And luckily so less dependent on body weight at that point but really just through this process of generation more glucose. So yeah. It will definitely kick you out of ketosis.

**Dr. Lyon:** However, when you think about optimizing protein in a ketogenic diet, the standards remain. I think that everybody is so variable. I mean, I have tried a ketogenic diet myself and what I have found to be the best is actually going through it in cycles. So the majority of the time extremely low carbohydrate. I allow my body to have its own process of generating glucose. On a daily basis my carbs are easily, dietary carbs are easily 20 or less. And I think that that would fit 20 grams or less which I believe that that would fit in line with a ketogenic style of eating. But I don't measure ketones and I certainly cycle between optimizing protein intake at one gram per pound body weight. Not lean body mass, which is the recommendation.

**Dr. Lyon:** Lean body mass and or ideal body weight will definitely kick an individual out of ketosis depending on the person. I don't know if that answered your question. But ...

**Robb:** No, it does. And I'm never sure if this is confirmation bias. Like am I just fishing around for confirmation bias? Because we kind of find these corners of the world or the Interweb where it's like, "Oh, these people are saying things that are amenable to what my thoughts are." But it's interesting. Ages ago Michael Eades, I want to say it was like-

**Dr. Lyon:** Yeah Michael Eades, yes.

**Robb:** ... late 90s. You know?

**Dr. Lyon:** Yep.

**Robb:** And he made this case that it really stood out and it stuck with me over time, but he made the case that it wasn't so much specifically about being in ketosis. Like maybe that's important. Maybe that's not. But he made the case that if to the degree you run on glucose, make that glucose come from protein and then we've got this really buffer system. So, the protein gets converted into glucose. The glucose gets stored into glycogen. That glycogen has a really tightly monitored release profile. And then the other person that I followed is a Dr. Bernstein, the diabetes solution guy. He's a type 1 diabetic. He's 85 years old. Still full medical practice. Kicking ass. Lifting weights. And he's very protein-centric and kind of moderate in fat.

**Dr. Lyon:** Yes. And I believe in my clinical practice, I practice this concept of muscle-centric medicine and it's this concept that muscle is the organ of longevity. Truly an endocrine organ. And during my fellowship at Wash U in St. Louis, I did a geriatric fellowship. So I did obesity medicine and geriatrics as a fellowship, and seeing aging really that becomes the point where prior to that trajectory of aging, so prior to the age of 65 is truly when

you have to be optimizing muscle tissue. I mean, it's really interesting to see the ship, because people like 40s and 50s are still incredibly active. So their tissue is different but that's really a small percentage of individuals. The majority of individuals, sarcopenic obesity, sarcopenia. The destruction of muscle tissue. Loss of muscle mass and function. Power output and strength. It really starts in your 30s.

**Dr. Lyon:** So it becomes interesting. I think a great question is to determine what is a nutrition plan that is going to keep body composition optimized while keeping intact healthy muscle. And there is protein sparing effects and muscle sparing effects in ketosis, and from a clinical perspective over the last decade, men seem to do very well on that. There does become that kind of inflection point, I do think about aging. And that aging tissue is a really good place to kind of switch over that higher fat and replace it with optimal protein because of anabolic resistance. Because of the tissue. There's impaired metabolism. The body. The sensing. The mTOR sensing. The ability for the body to sense amino acids decreases.

**Robb:** And you know we had a question along the mTOR route and this might actually be a good spot to drop that in. This one's coming from Ryan and his question was, "Does the evidence truly say that the risks of meat/protein intake when it comes to factors such as mTOR, IGF. Is there truly something to worry about? Why or why not?" Like this is one of the hottest topics around.

**Dr. Lyon:** I love this question. So, let's take a look at relative risk. There's this concept of relative risk. And this is the risk of doing the action and getting the disease. So for example, the relative risk of smoking and cancer is 12. And if you would look at the literature it would be an increased risk of 1,000 to 3,000%. So in order for something to be clinically significant, a relative risk has to be over two. So these are just kind of statistical numbers that we look at when you look at data. So they've done many analysis including analysis with this system called the grade system, and I'm sure [inaudible] determining in the Annals of Internal Medicine, determined should we cut back on protein intake.

**Dr. Lyon:** And they determined ... and this is a really important point and then I'm going to get to mTOR.

**Robb:** Sure.

**Dr. Lyon:** They determined that the relative risk of eating protein and cancer was 1.2. Maybe 1.3. So that equates to an increased risk of anything, whether it's stroke or whatever the issue that they were determining it was going to cause was 18%. The risk of eating a moldy grain with aflatoxin is considered 600%. So just to put that in perspective when the number one question is at what point does something become relevant, right? So the relative risk of smoking and cancer is 12 or 1,000 to 3,000% increase. The relative risk of eating a moldy grain is 600% increase or six, and then the relative risk of eating a protein heavy diet is 1.2. Or an increase in 18% which is considered clinically insignificant.

**Robb:** Right.

**Dr. Lyon:** So that's just looking at the data. And then you talk about mTOR. So mTOR is a really interesting concept. So this is mechanistic target of rapamycin and what I think people in the literature or just kind of the people that are anti-animal, the anti-animal narrative does a really poor job in explaining that mTOR is in every tissue. mTOR is in skeletal muscle which is exquisitely sensitive to branched-chain amino acids and protein. There is mTOR in heart and brain and liver and kidney and pancreas. Liver, more sensitive to insulin and through insulin. Carbohydrates.

**Dr. Lyon:** So when you think ... and the increase in IGF-1, the increase in mTOR really just comes from an anti-animal narrative, which is saying that somehow ... they're saying that just the animal product and the increase in skeletal muscle, mTOR stimulation, is what causes cancer. So just the logic makes no sense. On a much more fundamental, this is an anti-animal narrative that is truly happening.

**Robb:** This is the ... it's part of the vegan whack-a-mole game where when you're trying to address one topic, another topic gets raised. And yeah. Yeah.

**Dr. Lyon:** It's really brutal because it's devastating to the population and it's devastating to your parents. And the aging population because they hear protein and then think cancer. As opposed to excess adiposity, excess insulin, overconsumption is a much more potent stimulator of mTOR in all the other tissues.

**Robb:** Right.

**Dr. Lyon:** So, it becomes very confusion for the individual. Like the public to even make sense of it all. So, no. Protein doesn't cause cancer. If protein was bad for you in the way that they say, then exercise that also stimulates muscle tissue as it relates to mTOR would also be bad. And yeah. And IGF-1, if that were in fact bad, then every young man that I've ever seen or every SEAL that I've ever seen with optimal levels of IGF-1 would have cancer.

**Robb:** Right. Right.

**Dr. Lyon:** Which the whole thing doesn't make sense. The narrative doesn't make sense.

**Robb:** Let's take a quick break for the Healthy Rebellion Radio trivia.

**Nicki:** Today's trivia sponsor is Drink LMNT. Drink LMNT is giving a box of LMNT Recharge Electrolytes to three lucky winners selected at random who answer the following question correctly. And Robb, this has been top secret until now. In fact, I feel like this is the first place that this is being announced publicly, but we got the okay from Diana. So tell us. Who is narrating the film Sacred Cow?

**Robb:** It is none other than Nick Offerman. Sometimes better known as Ron Swanson from the sitcom, Parks and Rec.

**Nicki:** Parks and Rec.

**Robb:** And he is famous for the scene where he's in like a Whole Foods type setting and they have a food sample and it says, "Vegan Bacon", and he walks up to the guy and he's like, "I'd like one of those", and he takes it and throws it in the garbage and he's like, "Another." And he just keeps doing this. So yeah.

**Nicki:** Awesome. And it sounds great and so we're super excited about that. So folks, your answers. Nick Offerman this week. To play, go-

**Robb:** We'll take Ron Swanson, too.

**Nicki:** Or Ron Swanson. Okay.

**Robb:** Yeah.

**Nicki:** To play, go to [robbwolfe.com/trivia](http://robbwolfe.com/trivia). Enter your answer. We'll randomly select three people with the correct answer to win a box of LMNT Recharge Electrolytes. The cut off to answer this week's trivia and be eligible to win is Thursday, June 18th at midnight. Winners will be notified via e-mail and also on Instagram as well. This is open to residents of the U.S. only. And now back to the interview with Dr. Gabrielle Lyon.

**Robb:** I'm trying to think of how to ask this question without it being super leading, but let me tackle it this way. What are your thoughts on autophagy? Like how important is autophagy within this greater story of health and longevity and whatnot?

**Dr. Lyon:** You know, I am certainly not an expert in autophagy. You know, right? The concept of the cells being able to clean themselves, regenerate. I mean, fasting certainly would be really the way in which I would implement that kind of thinking into my practice. But certainly not an expert on the subject.

**Robb:** Okay. Okay. I did some tinkering on that and it's interesting. Coffee increases autophagy. Lifting weights increases autophagy. Getting a tan increases autophagy.

**Dr. Lyon:** Interesting.

**Robb:** And there's all this stuff that we really can ... I found this paper. I actually meant to forward it to you where it looked at sun exposure in relative risk in people who don't get enough sun are as at increased risk of morbidity and mortality as the difference between smoking and non-smoking. Like it's-

**Dr. Lyon:** Oh, that's interesting.

**Robb:** ... enormous. So-

**Dr. Lyon:** And it had like compounding variables were all ... were there a lot of compounding variables? Or was it a pretty-

**Robb:** I assume so.

**Dr. Lyon:** You'll have to send it to me.

**Robb:** I'll ping it to you. But it was interesting. And it was in a nice, reputable journal. Doesn't mean that something squirrely didn't sneak by. But there's a ... it's one of these things where it's like okay. Sun's probably good for you. Working out is good for you. When we keep digging in the literature on coffee that seems pretty good for you. So there seem to be all these things that are like give mes, you know? But then this fasting thing. I've seen people so geeked out on fasting, and when I look at them, this sounds horrible, but we have people that are maybe in this broader ancestral health scene, which usually people look pretty good. They carry a little muscle. And I'm starting to see people that I'm like, "Are you a raw vegan?" And when I talk to them it's like they've been fasting for the last nine days.

**Robb:** They had 30 grams of protein a day on the days they weren't fasting. How are people maybe missing the mark on that?

**Dr. Lyon:** Right. So that's a really interesting question because fasting is coming up more and more as a tool in the toolbox for augmenting things like autophagy. And really just longevity, right?

**Robb:** Mm-hmm (affirmative).

**Dr. Lyon:** We're chronically overfed, and largely domesticated physically. So allowing for calorie control, certainly fasting is a strategy. And there's numerous other methods, right? I use it for patients with eating disorders. I use it for all kinds of things. Gut imbalances. [inaudible] that you can really think about.

**Dr. Lyon:** So when you think about fasting and muscle mass, it's really interesting because a couple things come into play and that is number one, you can attack tissue if you're training hard enough. And this is interesting. When you look at some of the vegan vegetarian athletes, although you not find them nearly as kind of jacked and tan as perhaps other athletes; there is a capacity to offset that muscle tissue because of the stimulation of muscle tissue is either one, through exercise or two, through nutrients like branched amino acids and protein stimulus.

**Dr. Lyon:** So I think that the majority of individuals cannot offset the lack of protein by training. When I say training, we're talking about hours and hours of training to be able to maintain that tissue.

**Robb:** Right.

**Dr. Lyon:** And then with the fasting aspect, the risky part becomes as you age that tissue is very hard to get back. So, I think when we're always ... the framework of conceptually thinking about things is what can be done for the long-term. Because the body will trade off long-term survival for short-term maintenance. Which I think is what you're seeing when you see these individuals who would be considered probably sarcopenic.

**Robb:** Right. Right.

**Dr. Lyon:** Right? And then you get there has to be so that the sustainability is not there and then that change in tissue has occurred because maintaining your muscle fibers is an uphill battle as we age. No matter what, right? No matter who you are. What kind of athlete you are. It is. Right? There's just a loss of innervation. A loss of strength. The loss of diameter. Just it's a loss. It stinks, but it happens.

**Dr. Lyon:** So you have to be able to protect that tissue and where fasting comes ... I never recommend fasting for an aging population. I think that that is bad medicine. Because it's really risky. And especially now if you think about the inability to be as active as we were, for a lot of people that perhaps are using this to fast or whatever. But the devastating consequences of the aging individual to not be able to go for walks depending on where in the world you're living, right? If they were in New York City, a high transmissible area, arguably. Whatever.

**Dr. Lyon:** But gyms are closed. So now you have ... this is not the time to be ... I mean, in my opinion. So protecting tissue and thinking long-term strategy. That being said, fasting is great for a period of time. Just a very clear defined period of time. So if you're going to do kind of a cycle of methionine restriction, right? Maybe you're going to do that for three months and you're going to do it for a week. Once a week for three months, there may be some benefit. Of course we don't know because methionine restriction, that kind of data is largely rats. And rats have a different methanine requirement because of their fur.

**Robb:** Gotcha. Interesting. Interesting. When I did my longevity talk for this year, it was interesting. There were papers that were basically suggesting that we've bred these lab animals in such a way that they're effectively worthless for learning anything from them at this point. And there was a comparison of a wild type mouse that they tried to put into an overfed environment, but it wouldn't overeat. And even on junky food, it wouldn't overeat. And so that made the case that we've basically bred these mice to overeat, but we've never allowed them to develop a defense against the overeating. And so what exactly can we extrapolate from this stuff? Yeah.

**Dr. Lyon:** Yeah. And that's interesting. And you know even the way in which they're doing the studies, right? So you got these ... it's so interesting as you start to see the anti-animal narrative of [inaudible] protein that the rats in a lot of these studies as it relates to IGF-1 and cancer or trying to devalue protein, these are overfed rats. They've gone to many lengths to ensure that these are obese models. And that's interesting, right? So it wouldn't be ... it's not necessarily helpful looking at the whole population at all. These are like sick rats.

**Robb:** Right. Right. And so you definitely touched on Kristen's question. Mainly around things like OMAD, like that one meal a day fasting. So where is a balance that we can strike in this? Because as much as it makes me cringe when I see people wearing t-shirts that say, "Body by Autophagy", and it's like, oh you did that too well. Sarcopenia is running rampant.



**Robb:** So they've been an overachiever there. But really at the end of the day, that's not the problem. The problem is a massive chunk of our population being metabolically broken. Heading towards type 2 diabetes and a host of chronic degenerative diseases. Some degree of time restricted feeding does seem to be an interesting lever. So how do we ... What's a middle ground there between having an eye towards effective aging but also using that as a lever towards calorie control?

**Dr. Lyon:** Everything has a season. So when you think about goals, you really want to break it down into really three main goals. Are you looking at optimizing body composition? Which would be on strategy. And that would primarily be weight loss. So one lever would be weight loss. One lever would be maintenance. And one lever would be weight gain. Right? And I think that from a perspective of action, when we think of it in these three ways, we can really identify what the next strategy is. And again, everything goes in seasons. So for individuals who are interested in weight loss, I think that intermittent fasting, time restricted feeding at two meals a day is absolutely helpful, right?

**Dr. Lyon:** So you're eating in an eight to nine hour window. You're very strategically stimulating muscle [inaudible] synthesis. You're having an mTOR stimulation twice a day. A lot of the literature is based on three times a day, but let's just say we're going for weight loss. The critical component of weight loss is maintaining high quality tissue, right? You don't want to lose at any given time 30% of the tissue that you lose when you're losing weight is muscle, which is our metabolic currency. So if you create strategically your goal is, okay, I'm going to lose weight right now. I'm going to have two meals a day. I'm going to optimize my protein intake and just my caloric intake in those two meals that is set and strategic, then you have a capacity and then you figure that you're going to throw in some training.

**Dr. Lyon:** You've now protected your tissue and stimulated muscle twice a day. It is a great viable strategy. So that would be one perspective. And then when you think about maintaining weight, those are individuals that are already probably could do the one meal a day because they've got their routine. And you'll typically see this. You notice people that are dialed in they really don't have to think about it that much. And they've got their strategy. They know. They're very good. They have low recidivism rates. They've got it, right? They're not relapsing. And those people are people that can typically do one meal a day. And you've got to think, their body composition might already be optimized.

**Dr. Lyon:** So they're good, right? Not necessarily a strategy for aging. One meal a day is not ideal. And not just based on the literature, the aging literature. It just doesn't protect tissue the way that it should. However, if you were in a younger season of your life, that's totally doable. And then of course there's the weight gain issue. And that's really nobody wants to gain fat for the most part. So that would be a muscle tissue issue. And really that could easily be three to four meals a day. Time restricted feeding. When you're looking into gaining muscle tissue, yes, there are ways to do it. But one way that is, I would say user friendly, is optimizing protein four times a day. No problem.

**Dr. Lyon:** Determining how much you need. Hitting that anabolic threshold. And going through a season like that while minimizing fat gain.

**Robb:** Gotcha. Doc, have you heard anything that muscle gain disproportionately occurs during the summer relative to the rest of the year?

**Dr. Lyon:** I haven't.

**Robb:** A good friend of mine-

**Dr. Lyon:** But it would.

**Robb:** Yeah.

**Dr. Lyon:** Yeah. It would. Interestingly, depending on location, there would be components of that, that would make sense and I would think that that would be more environmental as it relates to. You know, it's interesting. I did start reading about the circadian rhythm in muscle tissue. I don't know enough about it to share, because I haven't looked at enough data. But there are some very interesting concepts as it relates to the clock genes in tissue.

**Robb:** Gotcha.

**Dr. Lyon:** That being said, it would make sense that in the summer it's possible. I mean, I could see that because number one, you're doing more physical activity. Number two, your vitamin D is higher.

**Robb:** Mm-hmm (affirmative).

**Dr. Lyon:** Right? You're probably doing ... you're able to maintain a higher testosterone or whatever it is. It's not like that oppressive winter. Although you don't have oppressive winters. You're in Nevada.

**Robb:** We're in Texas, now. Yeah. And it's even better.

**Dr. Lyon:** Oh great, Texas.

**Robb:** Yeah. Yeah. Just moved to New Braunfels about a year ago. So yeah. And my health is better. My digestion is better. A bunch of GI problems I have. Funny enough, getting out in the sun every day and getting some water on my body, I get healthier. So who would have thought? You know? Yeah.

**Dr. Lyon:** Yeah.

**Robb:** Let me see here. Let me take a peek at some of the questions. I think you kind of touched on a question that Kent had which is he follows your work closely and you've made recommendations of at least 30 grams of protein with each meal to ensure that we get kind of an anabolic stimulus. But if we are eating fewer meals per day, my understanding is that that anabolic stimulus needs to be larger. Like if we're looking at ...

I know it's tough, because it depends on the total size of the person. But if you're eating one meal a day, you've got to eat a huge amount of protein in that meal.

**Robb:** If you're eating two, it's a little bit less. But is it safe to say that the more frequently you eat, kind of the relative magnitude of the protein can be somewhat less and still get that anabolic signaling?

**Dr. Lyon:** That's a really interesting question. I think the first place to start with that question is determining total protein need. And whether you're doing a ketogenic style diet or you're doing an optimal protein diet. Those numbers are going to be totally different. So let's say you were going to do an optimal protein diet. The minimum amount of protein required for an anabolic stimulus, safely, is 30 grams which would be two and a half grams of leucine. Listen, arguably in the literature it's 1.8 grams but that gets a little hairy depending on your age. So everyone to be able to get benefit the data would suggest that at 2.5 grams, one bolus amount the amino acid level in the bloodstream rising would indicate that would be the best number.

**Dr. Lyon:** 30 grams is the minimum. 50 grams will likely have a more optimal robust response. Anything above 50 grams while protein is all utilized for many other reasons, it won't have an increased stimulus on muscle tissue.

**Robb:** We get kind of a flattening.

**Dr. Lyon:** So you can easily get away ... what?

**Robb:** We get kind of a flattening at 50 grams. It might be useful because of satiety if you do overeat, it's less likely to be stored. But we're not going to get additional anabolic signaling.

**Dr. Lyon:** Right. And it's interesting because protein, especially high quality protein like branched-chain amino acids, leucine actually stimulates CPT1, which helps with fatty acid oxidation. So there are many. Which is one of the reasons that and the very high thermic effect of feeding and then having to get rid of the ammonia to urea. These very costly processes is very difficult to store, right? You don't want to put on weight. The body wants to utilize protein. Every amino acid has a role. Every amino acid is utilized as opposed to carbohydrates and fat.

**Robb:** Right.

**Dr. Lyon:** So that being said, you can get away and do very well with 50 grams with two meals. I mean, that would cover your basic protein turnover for sure. Just about for everybody to maintain a homeostasis.

**Robb:** Interesting. Okay. Well, that's pretty darn easy. Let's see here. Greg has a question and you alluded to this a little bit. The fact that the gyms are closed. What are some options for stimulating some muscle growth for folks that are at home? Like the X3 bar is pretty

cool. Of course, body weight training. But you're on house arrest. What gear do you magically want and do or what things do you pick to do to maintain muscle mass?

**Dr. Lyon:** So this, I'm going to give you the science and then I'm going to give you my personal experience. And science would suggest, right? And this is Stu Phillips. Out of Stu Phillips lab at McMaster University. Fantastic, fantastic researcher. Really first rate. He would tell you that as long as you're going to exertion and fatigue, that you would be able to stimulate your tissue. So you could be an aging individual, aging. You could be in your 50s and lifting lighter weight, but going to exhaustion and fatigue and get the same robust response.

**Dr. Lyon:** Arguably, I would say in real life, I don't have experience in that. I'm sure you don't experience that. It's very difficult to get a same, robust response and maybe it's a mental intensity thing. So I'm going to say that that's what the science would suggest would be helpful. You can also improve insulin sensitivity with high intensity interval training. There's lots of different ways to do that. It would really depend on your training status. Okay. So there's those two things. So resistant training, you can do lighter weights. Full body compound movements. It could even be noncompound movements according to the literature, as long as you are exercising your muscle groups to failure.

**Dr. Lyon:** Now, I'm going to tell you what we do. Okay. So I'm married to a Navy SEAL. You do not want to be on quarantine with a Navy SEAL, right? It's like the worst thing that could ever happen.

**Robb:** And you have a small child, also. So ...

**Dr. Lyon:** I have a husband who is a SEAL who is in full-time medical school, okay? Full-time medical school at a really great medical school. And he's at Rutgers, which is a lot of work. And I have an infant, okay? So what do we have? I turned our entire apartment ... we live in New York, into a gym. So we have an Assault Runner, treadmill for interval sprints. We have an Airdyne bike. And we have a SkiErg. And we've got weights. And that will rotate depending on the day. Everyday something will happen.

**Robb:** Mm-hmm (affirmative).

**Dr. Lyon:** And so that's just my personal recommendation. It really depends on how much sleep you're getting and what your goals are. I think everyone's goals for right now if you're living in close confound areas, your goal is to maintain. Unless you are from Austin Texas and you can be outside and you're going through first phase of gym openings, that's another story. But I think for many of us at home, maintenance is key. And consistent activity is key because we're not moving as much. So, that would be my recommendation.

**Robb:** Love it. Love it. Let's flip this around a little bit and you have kind of-

**Dr. Lyon:** Any babysitters out there?

**Robb:** Pardon?

**Dr. Lyon:** I said you got any babysitters out there?

**Robb:** We'll shake the trees for you. This is the second time this has come up. This may be a cry for help here. So ...

**Dr. Lyon:** This is a legitimate cry for help. Please help.

**Robb:** Okay. You know, you guys can just come to Texas and hang out with us until this thing wraps up, so open invite on that. But let's flip this around and limitless budget, whatever the gear that you were going to orient things towards the most effective aging possible. What does kind of training look like with regards to a mix between resistance training, within the resistance training? What type of sets, reps, volumes are we looking at? How often are we doing like low intensity cardio versus intervals? Because the endurance stimulus is a bit antagonistic towards muscle growth. So how would you parse all that stuff out in an ideal world?

**Dr. Lyon:** So it's really interesting. There's ... obviously this depends on age, and really cross training is absolutely the best. So that long steady state is very antagonist to optimal muscle growth because exercise, despite what the assumption would be, is actually catabolic. The anabolic processes of the exercise really don't happen till after the exercise and you're in a recovery phase. So that's an interesting component to think about when it comes to training. So there are certain recommendations. Just guidelines that I don't necessarily agree with, where they'll say, "Oh, you have to have 150 minutes throughout the week of elevated heart rate. Over 70% of V02Max." Right?

**Dr. Lyon:** So these are recommendations based on a very ... what's the word? Sedentary population. So what I would recommend and what I do recommend for my patients is, really ... and number one, it depends on the training status. But really getting a great program. Compound movements depending on the training cycle three to four days a week. And I believe ... and again, this is personal opinion now that we are largely domesticated. So a three to four day a week program that is very well planned out with compound movements to build that foundational muscle strength. Really working on those type two muscle fibers. Really getting that strong tissue which is the tissue that actually converts as you age.

**Dr. Lyon:** You actually convert type one muscle fibers as you age, which is that kind of like skinny ... nobody wants that. You know? So getting a really solid program like that, three to four days, heavy compound movements, squat, bench, deadlift, and that can also be ... you can also use kettlebells as well during that time. But I think dedicated strength is key. And then on the other days you have ... so if you got three or four days like that, then the other three days I do believe ... and this is more probably robust than most people would recommend. But I do believe in interval training those other three days.

**Dr. Lyon:** Really working on that capacity. I think slow steady state cardio is very overrated. Because when you think about what are the benefits of that it is good for, I even would consider it nonexercise activity.

**Robb:** Mm-hmm (affirmative). Mm-hmm (affirmative).

**Dr. Lyon:** Right? So I think that getting another three days of high intensity interval training, whether it's 200 meters, six sets of 200 meters for time or 500 meter rows for time that kind of a thing is very beneficial.

**Robb:** Fantastic. I love it. Could my Brazilian jiu-jitsu fill in for maybe two of those interval days?

**Dr. Lyon:** I mean, I do think so. That's very taxing. It's very ... And Shane actually just started doing that. Well, before COVID hit. He was really into that. And he would come home and say, "Man. This is ... " By the way, he didn't tell anyone what he did in his life and they were like, "Have you ever done this before?" He's like, "No." But it is very challenging in that way.

**Robb:** Yep. Yep. Love it. Hey, Rachel has a great question. She keeps getting push back from vegan doctors saying that you can get quote, "Complete protein from plants", which may be technically true. But of course they don't discuss the amino acid ratios or the absorption. Can you address that? Because this is just a constant bugaboo that we have to deal with.

**Dr. Lyon:** So it's so interesting that this is still happening. Protein quality are ... really, these are hard and fast biological numbers based on amino acids. There's no opinion. We could argue if it's better to eat radishes or asparagus in the month of June, right? But when you're talking about hard, fast biological numbers, it's really hard to argue that one plus one equals two. So there is this grading system. So there was PDCAAS and DIAAS. And these are ways in which you grade proteins. And the DIAAS is the score of say, 75 or greater is considered a high quality protein. And when you look at the plant versus animal-based proteins, again, you can definitely get all the amino acids you need.

**Dr. Lyon:** An example would be you would need six cups of quinoa to eat one small chicken breast. Based on these DIAAS scores and just based on the hard, fast biological value. So if you believed what I had said earlier about leucine requiring two and a half grams of leucine to stimulate muscle protein synthesis, in order for that to equal like an average amount that say, a vegan or a vegetarian would be pushing, you would need 25 to 40% more calories. So that's six cups of quinoa would be 1,000 calories.

**Robb:** So you're just implicitly going to overeat just trying to hit your protein minimum.

**Dr. Lyon:** Exactly.

**Robb:** Yeah.

**Dr. Lyon:** And so the vegan vegetarian doctors have a very specific bias and there's a dogma that runs there, and it's interesting because the one thing that you can't argue is the biological value of protein. I mean, that is not arguable. And if you wanted to check it out, you can look up DIAAS and PDCAAS and these are a scoring system. And it's really based on the amino acids and the ability to absorb protein because plant-based proteins have a fiber matrix. So ...

**Robb:** Well, it's funny. Right before COVID struck, there was some pretty good hullabaloo because a good number of the vegan docs were getting together and trying to create their own protein ranking system.

**Dr. Lyon:** Awful. That's awful. It's awful. It's awful. You know that?

**Robb:** I just wished that all of those people could be in the healthcare system separate from the one that I'm in and I'm like, "Hey man. Go do your experiment and we'll do our experiments over here, and we'll see you in 20 years."

**Dr. Lyon:** And I actually went through that data with Donald Layman, and he explained it so beautifully. I mean, they determined that wheat protein was the same as like beef protein.

**Robb:** Right.

**Dr. Lyon:** I mean, they literally made up their own scoring system. How does that even happen?

**Robb:** It's our brave new world. I don't know.

**Dr. Lyon:** It is scary. It's a narrative that is very scary. So just to answer your question, animal-based proteins have the same amino acids as plant-based proteins. However ... and that's not entirely true, right? You've got lysine. You've got other. Lysine, Methionine. You have other amino acids that are lower. But just to simplify, the amino acid amounts in each food group are totally different. And affect your health totally different.

**Robb:** Two thoughts there. One is your thoughts or commentary with what you just said related to the protein leverage hypothesis?

**Dr. Lyon:** Yeah. I was going to say that. But yes. Yes.

**Robb:** Perfect. So I would love for you to unpack that. And then we've been talking about muscle. What is the effect of protein, dietary protein on bone? So let's tackle the optimum or protein leverage hypothesis first.

**Dr. Lyon:** This protein leverage hypothesis was created by a person named Steve Simpson. And I don't know. I think he's a PhD. I'm not sure if he's a physician, but I think he is a researcher. And Steve Simpson studied animals and humans and noted that across all species, there is a drive to eat protein which is 15 to 20% of calories. And that individuals will continue to feed to reach that amount. So for example, if you were

eating a Twinkie, Ho Ho diet, you would continue to overeat to get that protein percentage in your nutrition.

**Dr. Lyon:** And what's so fascinating about the protein leverage hypothesis is that it's across all species. So humans and dogs and whatever. So that's the protein leverage hypothesis.

**Robb:** And maybe just a little bit more thought on that. Protein foods tend to be more nutrient dense.

**Dr. Lyon:** Always.

**Robb:** So some of the thought there is even cattle, if they're looking at clover or looking at grass, are going to head for the clover because it's got a higher protein content. And if they just hit that protein content, just kind of implicitly they end up getting their nutritional profile dealt with.

**Dr. Lyon:** Yep.

**Robb:** Yep. Awesome. Awesome.

**Dr. Lyon:** Very interesting.

**Robb:** So, what about the importance of protein in bone? This is something that folks don't talk about and like we're told that animal proteins in particular are acidic and it's going to dissolve your bones. What's the story with that?

**Dr. Lyon:** Wow. That's really bad, bad med. So, I had mentioned earlier that I spent two years doing a geriatric fellowship. That was rough. And part of what we did is we looked at bones and I took care of a lot of people that had fallen and broken a hip and had any kind of fraction that were never going to return to a normal way of life. One of the things that we did when we imaged their bones is you begin to see a trend and then you look at the data. And guess what makes the bone? Guess what's require for bone?

**Robb:** It seems to require it being like 60% protein or something like that?

**Dr. Lyon:** Protein. Protein is required for bone development. So, those that had the more optimal protein diet, and this is in the literature, actually had the highest bone density. So bone is made from protein and you require dietary protein for bone. And individuals on this call can just think about in their normal [inaudible] think about the very frail, tiny vegetarian. And I'm not anti-vegetarian at all. But if you just take a look at ... and of course, this is just visual. There's no data there. But you'll see individuals that are eating very low protein are the ones that are falling and twisting their ankle and breaking their ankle. Breaking a wrist. So bone and protein, there is a very strong correlation.

**Dr. Lyon:** High dietary protein. Optimal dietary protein is necessary for bone. And that's really well documented.



**Robb:** Yeah. Yeah. And a hat tip to Loren Cordain way early back in the day.

**Dr. Lyon:** Yes.

**Robb:** He dug up some good literature discussing the whole acid based story that as you eat higher protein, your body actually retains more calcium and magnesium so you get a buffering capacity and you end up enhancing bone mineral density. And-

**Dr. Lyon:** And that's really important, right? Because there's all this myth surrounding that protein is acidic and things like that. But actually exactly what you said. It's just there's calcium reabsorption and improved absorption.

**Robb:** Right. Hey, any quick thoughts on the carnivore diet? What are your thoughts on that?

**Dr. Lyon:** Yeah.

**Robb:** Who should do it? Who shouldn't do it?

**Dr. Lyon:** Yeah. I actually think that it's a great strategy to utilize. Again, I think everything has a season. But if you were to ask me my way of eating, I'm largely on the carnivore spectrum because I do believe that you don't need carbohydrates. And I don't actually do really well on high fat all the time. I found that I have a really hard time getting into ketosis for whatever reason. And so a carnivore diet, I think everyone should give it a shot. Try it out for four weeks. But everything has cycles. I do believe that polyphenols, there is an advantage too ... just you were talking about coffee has high amounts of chlorogenic acid for fatty acid metabolism.

**Dr. Lyon:** So there are aspects to other nutrients like cilantro and just other kind of herbal things that would be considered not optimized on a carnivore diet. So in essence, yes, I think that it's great for everyone to try. I would say I personally am largely carnivore-ish in nature. And I think that everything has its own cycle. Like if you were breastfeeding and pregnant, I probably wouldn't recommend it.

**Robb:** Except for the autoimmune person that's tried everything else and that's the one thing that works. Then we've always got those caveats. Yeah.

**Dr. Lyon:** Totally.

**Robb:** Hey, a little bit of a sidetrack here, a little bit out of protein specifically, but Vero has a question. "I'm always searching for optimal iron ferritin levels. What is too high? What's optimal?"

**Dr. Lyon:** Great question. So high levels of ferritin and now this in the literature really depends. So I'm going to tell you what I like to see in my practice. I like to see ferritin anywhere between 100 to 150. I'm happy. It depends on the value. It depends on what lab you're utilizing. Higher levels of ferritin can definitely be inflammation, stress, insulin resistance. The majority of individuals will have lower ferritin levels which is

considered ... which is the storage form of iron. There's a lot of reasons why. Absorption issues. Celiac. There's tons of reasons why. So that's where I like to see ferritin.

**Dr. Lyon:** You will definitely see an improvement. So I measure ferritin in all of my patients. You will definitely see an improvement in energy and also hair. So ...

**Robb:** Oh, interesting. Okay. Okay.

**Dr. Lyon:** Yeah. And ferritin levels should be around 130 for proper hair growth.

**Robb:** Okay.

**Dr. Lyon:** Which is definitely higher than most physicians would say. Most physicians would be happy at 75.

**Robb:** Okay. Okay. So another story of what's normal within a population that's probably sick versus optimal for-

**Dr. Lyon:** [inaudible].

**Robb:** Yeah. Okay. Okay. Sybil has a second question. "I want to know about being very low carb." I believe Sybil eats largely carnivore and now premenopause. "Why does eating carbs make me immediately hot flash? It must be some cephalic response because I barely had time to swallow." And she has like a-

**Dr. Lyon:** Interesting.

**Robb:** ... laugh out loud with it.

**Dr. Lyon:** So there could be ... so initially, I would think about postprandial hypoglycemia, but that doesn't sound like that's happening if it's immediate. So the next thing, right? So the next thing that I would think if it's immediate, that's more of a histamine type response.

**Robb:** Oh, interesting.

**Dr. Lyon:** Yeah.

**Robb:** Okay. Okay.

**Dr. Lyon:** That would be my best guess, you just really depending on what kind of carbohydrate that you are having. It can be an immediate mast cell [inaudible].

**Robb:** Okay. Okay. Man, I have a million questions and I've actually been sneaking in a bunch of questions that are mine for me, so even though I've been making it-

**Dr. Lyon:** Robb, anything for you. Seriously. Anything for you. I don't know if we're recording, but I've known Robb for a long time. We kept in touch and it's been awesome.

**Robb:** Yeah. And we actually ... we have folks watching live. And then this will go up later as well. One last question I'm going to shake you down for and this is completely selfish and personal. For the last several years, I mean probably five years, I've been on a two or three day a week full body kind of strength training program. So I'll do a press, a pull, a hinge or a squat and I just kind of rinse, lather, repeat. Do you think it would be worthwhile to bump that up to four days a week?

**Dr. Lyon:** Totally.

**Robb:** Two days of upper body, two days of lower body, and kind of cycle back and forth between those?

**Dr. Lyon:** Totally do.

**Robb:** Okay. Okay.

**Dr. Lyon:** You have to match your ... it's kind of like with everything in life. You need kind of a threshold and then [inaudible] has to be some stressor. A new stressor. I think it would be phenomenal.

**Robb:** Yeah. Because I feel like I'm at a spot where increasing either volume and intensity doing a full body movement where I'm doing a press, a pull, a squat, little bit of accessory stuff, I'm knackered after that. Like it almost feels like a little bit too much. Whereas I feel like if I were to partition that out, I could get a little more volume and intensity on the specific movements and then add some more stuff to it. Okay. Okay.

**Dr. Lyon:** Yeah. Let me know how that goes.

**Robb:** I will do it. I will absolutely do it.

**Dr. Lyon:** Amazing.

**Robb:** Doc, let folks know where they can track you down. I mean, you were by a landslide one of the most popularly requested people, so I think everybody knows who you are and knows where to track you down. But just in case there's like two people that don't, can you let them know where to find you on the Interwebs?

**Dr. Lyon:** First of all, thank you so much for having me. I love this community. Really. I mean, we all have to do it together. Nobody wins alone. And there's so much BS out there that we need a collaborative team 100%. So you can find me on Instagram. drgabrielleyon. And that's L-Y-O-N. Also, actually I have in the link, the link tree, whatever those fancy things are, on my Instagram I have a series of conversations with Dr. Donald Layman. So you guys can-

**Robb:** Oh, that's right.

**Dr. Lyon:** sign up for my YouTube. It's really ... because he's older, right?

**Robb:** Yep.

**Dr. Lyon:** 70s. And he's got so much wisdom that I really want to share it with everybody. So you guys can check out my YouTube and you can find me on my website. Dr. Gabrielle Lyon. And then the usual places. I do have a newsletter which is very valuable, and I put curated data and curated papers that I think are incredibly valuable that I have vetted that are just worth a read.

**Robb:** Awesome. I am a subscriber.

**Dr. Lyon:** And that's-

**Robb:** So, awesome.

**Dr. Lyon:** Yep.

**Robb:** Doc, thank you so much for coming on and I can't wait to see y'all in real life again.

**Dr. Lyon:** Yeah. Soon! Soon.

**Robb:** Well, when you guys need an escape, just let us know and we'll have you down here in Texas.

**Dr. Lyon:** Can't wait.

**Robb:** Okay.

**Dr. Lyon:** All right.

**Robb:** All right, doc. Take care. Bye-bye!

**Dr. Lyon:** Bye!

**Nicki:** That was an awesome interview.

**Robb:** She's amazing.

**Nicki:** She's great.

**Robb:** I had a little follow-up with her via text which I actually still need to get posted in the Healthy Rebellion where she provided some guidelines for folks to figure out how to find an appropriate carbohydrate level. And it was interesting. She makes the case that for the vast majority of people, 40 grams of carbohydrate per meal is probably an upper ceiling for most people. Clearly, there's exceptions out there. But she makes a pretty compelling case around that and then kind of details how to do it. So I will get on top of that and make that kind of a post in the Rebellion.

**Nicki:** Awesome. Folks, be sure to check out our show sponsor Four Sigmatic for all of your mushroom, coffees, matchas, cocoas, mushroom elixir mixes and more. Go to [foursigmatic.com/rebel](https://foursigmatic.com/rebel) and use code REBEL for 15% off your order. And I think that's all for this week. I hope everybody has a wonderful weekend.

**Robb:** May all of our next weeks be better than this week.

**Nicki:** Cheers everyone.

**Robb:** Bye everybody.