

# The Paleo Solution

## Episode 19

Andy Deas: Robb Wolf, Andy Deas, Paleolithic Solution, episode 19. How are you?

Robb Wolf: Good. I did not kill Corey Haim.

Andy Deas: I think that was a blog comment of the week, man, the suggestion that you kill Corey Haim. I think that was -- maybe there's something going on that we don't know about.

Robb Wolf: It was almost as popular as the drink as much as you can to optimize your sex life but not decrease your performance so...

Andy Deas: I can't wait until you pitch that one on Ellen.

Robb Wolf: That's sage advice there, man. I mean we can turn around the growth slump in all of the westernized countries with that one bit of recommendation so...

Andy Deas: I'm kind of bummed throughout the new Corey -- the Corey Haim thing because now there will never be another season of The Two Coreys and I know you didn't watch that, Robb.

Robb Wolf: I did. I actually see one season of it and it was horrible. It was a train wreck worse than even Celebrity Rehab so...

Andy Deas: Dude, when Corey Haim found out he wasn't going to be in the Lost Boys sequel and broke down in tears, I mean that was a very touching moment for me. I was hurt.

Robb Wolf: Andy, you like to gloat at other people's failures so...

Andy Deas: That's true. That's true.

Robb Wolf: That's why you became a trainer.

Andy Deas: Be nice. Be nice. Robb, you want to give us a quick book update, like what's going on? We're getting close to your self-imposed deadline. I notice you're -- I got an autoresponse from your email, like "Hey, I'm not responding to email. I'm trying to finish the book."

Robb Wolf: Yeah. I have gone fully fetal on the -- like returning emails and all that. Relative of Corey Haim, Nick, we definitely did receive **Rad** from **Sincere** **[0:01:36] [Phonetic]**. We received the Afro brutality t-shirts. There's a bunch of stuff I need to follow up on and just have not done that and probably won't get to it until after April 4th.

The book is actually chugging along really well. I'm working on the exercise chapter right now which actually ended up taking on a much larger dimension than what I originally thought it was going to. I just kind of had some inspiration on that and then wrapping up really kind of odds and ends after this chapter, some vitamin D kind of sunlight stuff, very, very reminiscent of Protein Power Lifeplan. And then charts, graphs, side boxes, all that sort of stuff. But those things are much easier to write. They're usually a couple of paragraphs instead of like a whole chapter kind of thing. So we're looking on task.

I spoke with the publisher the other day and we're probably looking at September 1st availability in stores. There will be preorders available here pretty soon, so the Amazon, Barnes & Noble, that sort of stuff. And in the first weeks of September I will definitely be on the road pimping the book and whoring myself shamelessly to promote that effort. So that's kind of the update as it stands right now. My wife is still threatening to kill me if don't make April 4th, so there you go.

Andy Deas: Not to go on a tangent, Robb, but did you just say we received Rad and like I wasn't told that it already came.

Robb Wolf: It's sitting on my table. Yeah, dude, I'm really sorry. I knew that there was going to be some **[0:03:13] [Inaudible]** to you. But, yes, we do have Rad. We will a screening of it. We could actually do the JumboTron screen. Yeah, so... Maybe Nick will come for that one too.

Andy Deas: It would be like three people in there watching that movie.

Robb Wolf: Yeah.

Andy Deas: But I would be one of them. And the other thing is, Robb, in the exercise chapter of the book, I mean are you going to quote Jim Wendler due to your current obsession with Jim "all things" Wendler?

Robb Wolf: I am having a bromance with Jim Wendler. It's funny. I really dig a lot of his stuff and lot of it just being ego check more than anything else. And the reality is I probably won't do a whole lot of Wendler quotes in this because it is so oriented towards the beginner, the way that the -- the

whole exercise thing is kind of laid out describing what the exercise patterns were of our ancestors, what the -- these folks were athletic and well-built and healthy and that it's just kind of woven into our DNA to be athletic and active in a very high level way.

And then some of the things that we face today -- cardiomyopathy, insulin resistance, loss of muscle mass and strength over a lifetime. And so looking at that stuff then looking really, really heavily at the beginner kind of approach to dealing with this because most folks who are already savvy with CrossFit or Max Effort Black Box or Olympic lifting, they really don't need a ton of help in that regard.

So the book is going to be very, very focused on the beginner so that folks can throw this stuff to parents, grandparents, aunts, uncles, brothers, and sisters, people who don't have a solid exercise background already. And then I will peripherally look at the intermediate and the advanced athletes, but that stuff I think is going to get picked up really, really well in the Paleo Diet for Power Athletes. And that will actually be where I do some Wendler quotes talking about ego and having a plan.

And one of the things I have pulled from Wendler's stuff is that it's almost -- what you were doing is almost less important than the fact that you have a plan and the fact that you stick with it long-term and there is not ego involved with your training. And I think that that's one of the interesting things with CrossFit which is both really, really powerful but also can be a double-edged sword is that the fact that every day is a competition. Every day the names go on the chalkboard, the ranking plays out. It's impossible to attack that without ego.

And when I was doing kickboxing or Brazilian jiu-jitsu or any of that stuff, you have opened rolling where you essentially compete and you do that most days to some degree, but there's a ton of things like positional sparring and drilling that are integral to building your game and I don't think we really see that enough in the sport of fitness. So that will be an interesting thing to see where all that stuff goes over time. But I think most of that is going to be in the intermediate and advanced topics which will be in the book with Cordain and Welbourn so...

Andy Deas: Very reminiscent of my favorite Dan John quote, "The plan is to keep the plan the plan."

Robb Wolf: Exactly. And the four seasons of training too.

Andy Deas: Yes.

Robb Wolf: And have a ton of good stuff, yeah.

Andy Deas: So all right. Cool. Well, we're almost there, Robb. I got one of those little things like when I was little I made, you know, where you track counting down the Christmas. You link those little pieces together and every day I tear one off, Robb, and someday it's going to be April 4th and I'm going to walk over to your house and ask Nicki, "Where are we? What's the book status?" and you know. We're going to find out.

Robb Wolf: And if somewhere around my house there's just a giant smoldering pit, you know it didn't work out well so yeah.

Andy Deas: Nicki just ended the whole thing.

Robb Wolf: Exactly. Yeah.

Andy Deas: All right. Well, we got a ton of questions as usual. I think the first thing we're going to talk about is I actually have -- we get a lot of questions about blood work and so we look at blood work a fair amount in the gym and obviously in your fitness consults and stuff. So one of my family members sent me a recent blood work and we'll post it as part of the show notes obviously. We will hide the names to protect the innocent, but I thought you and I could take a quick spin through them, maybe talk a little bit about what we see, what we don't see, concerns, points of contention, et cetera.

Robb Wolf: Can we mention male or female and the age?

Andy Deas: Sure. Sure.

Robb Wolf: Okay. So we have a 62-year-old male in this situation.

Andy Deas: Yup.

Robb Wolf: Yeah.

Andy Deas: 6'2", 216 lbs.

Robb Wolf: And so when we roll through this thing, at the top of the blood work it's actually kind of interesting they have some recommended lifestyle factors, and it's -- they're not that far off really when you really look at it, but it's still hilarious that they have daily intake of lean meat or beans -- bean people which is almost enough to make me cry, but we'll just

overlook that. But it goes through -- it shows some body mass index which really doesn't tell you a whole lot of anything. It certainly neglects body fat percentage which they claim to have taken some body fat percentage on here later. I wonder how they checked that bioimpedance or what the deal was.

Andy Deas: Yeah, I think it's -- this is done as part of their corporate wellness program.

Robb Wolf: Okay.

Andy Deas: So they periodically roll through and do this so I'm pretty certain that was something somewhere of bioimpedance.

Robb Wolf: Got you. The last time I had a bioimpedance done, it put my body fat at 32%.

Andy Deas: Wow! I was thinking you were looking kind of poorly.

Robb Wolf: Yeah. So those things are almost worthless depending on the situation. Interestingly, they are -- unless you get an athletically calibrated version they will actually work pretty well within the moderate to clinically obese range. But if you're athletic at all like you're around 8% to 15% body fat, it doesn't even know what to do with that so...

Andy Deas: One thing I thought was kind of interesting and maybe -- I don't want to spin out too much on this but relative to the book writing and now we've been talking about ancestral amounts of physical activity and stuff like -- for their lifestyle factors they mention 150 minutes per week and two days per week as the optimum goal. How do you think that compares to kind of -- as you're revisiting how much exercise that we optimally need?

Robb Wolf: It's woefully inadequate really when you get right down to it. It's less than -- I mean it's like 30 to 50 minutes a day kind of gig which -- depending on the activity level, obviously any movement in that direction is good but it's -- one of the papers by Cordain and Eaton early papers where they're tracking ancestral activity patterns and the amount that they did they kind of critiqued the American Council of Exercise Physiology kind of the medical exercise branch of the AMA and just mentioned that the recommended levels were just less than half what the ancestral levels should have been or appeared to be in.

So certainly it's a move in the right direction. People need to do more activity but there's -- it's kind of funny because this thing goes in a very

big circle. People will say, "Oh, it's calories in, calories out." No, it's not calories in, calories out. It's food composition and it's all of those things. And a lot of the stuff that I end up talking about in the book is just some of the non-insulin mechanisms for glucose management like a carrier molecule called GLUT4 which transports glucose and other nutrients into the muscles and it does it without insulin and it's only turned on from exercise.

And when we're exercising at ancestral levels which is basically take a well ramped up kind of decathletes, soccer player, football player, somebody who is doing a lot of work, strength training, metabolic conditioning, restorative kind of mobility work and all that. That's about the level of work that we should be doing for health. And it ends up being a lot on the one hand but not as much as what we see with some other folks when you start getting into the ultra high levels of endurance athletics and stuff like that like the level of activity necessary to be competitive and those realms I think starts putting you supra normal outputs and also all of one flavor like it's all in the oxidative pathway.

Andy Deas: Right.

Robb Wolf: There's not really enough balance there from a health and longevity standpoint. From a performance standpoint then that's spot-on for what you need to do to be successful as a cyclist or a marathon runner or something like that.

Andy Deas: Right. All right. Cool.

Robb Wolf: Yeah.

Andy Deas: So I think we're hitting blood glucose next.

Robb Wolf: So to scroll down this thing, blood glucose is 111 which is -- the blood glucose thing is a little bit -- it doesn't tell you a whole lot. Also, you just want to make sure with all those blood work that it's actually taking in a fasted state so they claim that it's in the fasted state here. I find probably greater than 50% of the blood work that comes back the person really was not fasted. The lab didn't demand it. The doctor didn't really demand it.

So that can completely skew what you're getting with regards to blood lipid levels, the blood glucose level because there is an assumption that this is your baseline like 12-hour fasted. For this one it comes in at 111 which would be really quite high in my book. But it's tough to tell

whether or not that is actually the real problem because people simply from driving, from needle anxiety, a whole variety of stress-related stuff can end up getting elevated blood glucose level.

So that's why I really, really recommend that an A1C is taken at the same time. The A1C shows us what the blood glucose level has been over several weeks or a couple of months, and that tells us a much better picture with regards to blood glucose levels specifically, and then it also gives us some insight into what's going on with the LDL cholesterol and some other blood lipids.

Andy Deas: Cool. Oh, we're going to post that A1C paper, right? You're going to send that me?

Robb Wolf: Yeah, yeah, we'll put that A1C paper up. I know folks were really interested in that one. The A1C paper basically -- I think we mentioned last time being much more correlative of a cardiac risk factor, likelihood of a stroke, heart attack, cancer, like a whole host of problems being the best indicator of that being the A1C. The A1C showing how much glucose is sticking to one's red blood cells if you have high blood glucose levels either from dietary carbohydrate because of insulin resistance from lack of sleep or from stress induced elevated blood glucose levels. We've seen one of our trainers recently who had some adrenal fatigue then we can track all that stuff. The A1C, it's kind of a one-stop shop.

Andy Deas: Cool. All right.

Robb Wolf: The total cholesterol was 161, LDL cholesterol was 91 which isn't really that bad, but one of the things that we really don't know what's going on with it is the LDL cholesterol type whether it's a small dense particle or a large puffy particle. The large puffy particles are non-atherogenic, not really a problem. And what we found is that you can have a low, moderate-low LDL cholesterol and they're all of the small dense variety in it can be very, very atherogenic, very, very problematic.

When we scroll across the page, we see that the triglycerides were 132 which is way too high for what I would want to see. In the normal realm, they actually are saying that that's okay, but it's -- for me it's way too high. And so I would make a pretty strong assumption based off of this that the LDL cholesterol type is small and dense based off the triglycerides. So this is just something I would assume. But if we again have that follow-up blood work to support this we could really say, "Yeah, okay, we've got a pretty potentially atherogenic blood profile here." And then the good cholesterol, HDL cholesterol is 44 which is way too

low for what we would like. We need some more intense exercise thrown in the mix there to pop that HDL cholesterol up.

Andy Deas: Yeah. And on the triglycerides side, it was interesting to me that he listed out his optimal because I want to set -- like I would say on average what we see in the gym with most of our folks is like around 50.

Robb Wolf: Yeah, yeah, 30s to 50s.

Andy Deas: Yeah.

Robb Wolf: Yeah. And that just seems to -- and it's interesting again another Cordain and Eaton paper where they tracked ancestral blood lipid levels of hunter-gatherers. This is a really interesting thing which I had forgotten. The total cholesterol, the LDL/HDL cholesterol ratios among hunter-gatherers is right in the same levels that you see in all mammals, and interestingly it's right in the same levels that you see in newborn infants. And then it's only after the infant is weaned off of breast milk and starts eating a Neolithic or post-Neolithic basically kind of modern diet that you start seeing blood lipids change from the ancestral norm.

So you should see these same values across the board like you see it in all mammals, you see it in hunter-gatherers, you see it in newborn infants. And so this is what Cordain has historically kind of hung his hat on, and we do see some cultures like the Kitavans that have some elevated LDL amounts and some elevated cholesterol amounts but no atherogenic potential. We're theorizing that a lot of that is because of no grains and in otherwise kind of active healthy life. And then also they have a major source of fat as coconut which can elevate some cholesterol to some degree but it appears to be in a non-atherogenic way. So it's not promoting heart disease in that specific situation or at least the theory rolls that direction.

Andy Deas: All right. So we have A1C test would be a good follow-up, LDL particle size.

Robb Wolf: And then C-reactive protein is another one that is an inexpensive add-on that tells us what the overall level of inflammation is in the person. And normally, we see elevated C-reactive protein if we are sick, if we're fighting off an infection. So if we have comparatively high C-reactive protein and we're not sick, then it's an indicator of gut irritation is usually one of the major causes of that. Again, kind of Neolithic grain problem -- grain, legume, and dairy and/or just some sort of systemic inflammation.

The particle problem, the LDL particle problem can also raise the C-reactive protein because you're getting vascular irritation because of these small reactive LDL particles and so the immune system is reacting to that. And this is where everything fits in -- it starts a little elevation on one side and a little elevation on the other side. So our LDL particle sizes get smaller because of high insulin levels and so that makes them more likely to irritate the immune system. Because of elevated insulin levels, the immune system gets ramped up because of the whole prostaglandin, cytokine pathways that make the immune system irritated.

And then if we have a little bit of gut irritation thrown in on that or like gum or just some sort of a generalized infection, all of that stuff can individually be at a very, very low level but they add together and they're either additive or multiplicative, however you want to look at that. And that's where you can have some numbers that are really not that far out of the range in any one of those realms but together they end up being very, very problematic.

Andy Deas: And you also touched on I think a little bit there earlier about the need for possibly some more high intensity exercise?

Robb Wolf: Yeah, and that's -- that again, is going to fix that HDL cholesterol which -- I mean people go back and forth on whether or not the HDL cholesterol is really all that important but -- and it may or may not be. It may be more correlative than a causative kind of thing. But again, like that high HDL level we see in free living humans and cats and all that sort of stuff. So it's again -- even if that isn't the thing that's fixing the problem, it may be correlative of doing that stuff that ends up fixing other problems. And part of what we understand with the exercise now is the enhancement of the insulin sensitivity, the GLUT4, glucose transport and all that sort of stuff.

So there's a bunch of other good stuff that comes out of that higher intensity exercise. And high intensity again just to remind folks is very, very relative to the individual but the circuit training model, the sprint interval model, those things are perfect for that and then mixing in a little bit of a heavy weightlifting is a great overall program for bumping that good cholesterol up and then also improving insulin sensitivity so the triglycerides improve, insulin utilization improves. Again, very synergistic, very holistic when you tackle this thing. Better sleep, better food, better exercise.

Andy Deas: Cool. Another thing -- we were talking about this the other day that you mentioned I thought was an interesting tidbit is maybe you could share

your experience. You were sharing an anecdote about when you went to interview for one of the labs you worked at about how the clinicians blood values were tracked over time and --

Robb Wolf: Yeah, yeah.

Andy Deas: -- what they noticed based on what food they consumed.

Robb Wolf: Yeah. So one of the labs that I worked in was essentially like a support lab for dozens and dozens of studies like the Shanghai Study, the Women's Health Study. This was a lab where we basically ran blood samples, the checking for lipid composition, fat composition of red blood cells, and how much foliate or B vitamins these different samples had. And there were dozens and dozens of studies and all these samples would pump through our lab, and we were basically doing analytical chemistry generating all the raw data that was then shipped back to the labs that were -- the primary investigators on these different studies.

And it was interesting because when I went to lunch with the folks who were in this lab -- it was in Seattle and when we sat down to eat, everybody ended up ordering chicken or salmon with vegetables and then maybe like a side of fruit. And this was -- shoot -- maybe 2002, right around there. So the whole Paleo thing was very much in its infancy compared to where it is now. It was pretty new. And I started asking folks, "Why are you eating the way that you're eating?" And all of these folks in there were analytical chemists and they were in charge of different sample preparation in the different projects, but they typically used their own blood as a standard.

So when you're running samples, you need to have some sort of a standard by which you make sure that the instrument you're using is consistently calibrated. And so you have your own in-house standard and then you order standards typically from Aldrich or one of the chemistry supply places. And this is just basically so that you know that the temperature hasn't changed on your instrument or whatever. It's just so you know that your data is actually accurate and use it in your statistical analysis and all that.

And what these folks had found is that when they started incorporating in bread or rice or pasta or just anything along the Neolithic food line, they started seeing their blood values change in an unfavorable direction. Triglycerides would go up. Markers of systemic inflammation would go up. Reactivity of immune cells would go up in an abnormal way. So these folks literally through kind of trial and error because most of the people

in this lab had been there for like 8, 10, 15 years depending on which person it was, they would just kind of experiment with their eating and they all had arrived at this kind of a Paleo type diet -- meat, fruit, veggies, fish oil, olive oil kind of gig by tracking their lab values.

And then the kind of heartbreaking thing though was that all these folks, all these analytical chemists who were generating these data would pump these data then out to the statisticians and the folks who were funding these studies and largely the information will get recooked and it would still come out high carb, low fat, grain based kind of gig even though we in-house knew that that was not where the goods were at. You see this every once in a while where the Nurses' Health Study they actually come clean and they're like, yeah, higher fat intake ends up correlating -- showing better cardiovascular health, decreased rates of cancer, like all kinds of different things.

So it ends up coming out in the wash to some degree, but it was just very, very interesting seeing that these folks had arrived at this from a purely experimental standpoint like their whole nutritional situation was, experimentation on their selves essentially using their own blood as a standard.

Andy Deas: Yeah. It's very cool.

Robb Wolf: Well, if you're into that type of stuff I guess, otherwise -- you know we're down to two listeners at this point so yeah.

Andy Deas: But I think it does paint a little different picture as far as not necessarily having to follow some of the Paleolithic concepts and things, just the other side, "Hey, we experimented with it. We tracked what we ate and how it impacted our blood values and we still essentially arrived at the same conclusion that we're arguing for."

Robb Wolf: Yeah. And this is another one of those reasons why I'm a little reticent to even recommend a ton of blood work because I've seen it in a laboratory setting so much. And so this is where I'm just like, how do you look? How do you feel? How do you perform? And if people really -- they need that extra kind of handholding, that's like, "Okay, go out and do it," but -- I've seen it arrived at from a different direction. And so that's why I feel pretty comfortable just recommending folks usually run with it in that very, very experiential format instead of focusing so much on the lab values and all that.

Andy Deas: Sure. Cool. All right. Well, that was only 27 minutes, Robb.

Robb Wolf: I better talk fast. I better talk as fast as when I did a consult with Derrick this week so... Derrick had like 57 questions for me and he was like, "Please tell me the answer in a yes or no format." Okay, man, here we go.

Andy Deas: Little did you know that Robb cannot answer a single yes or no question ever.

Robb Wolf: There's lots of gray area in the world.

Andy Deas: All right.

Robb Wolf: I think that's why I get in trouble so much and get ousted. A little too much gray area so...

Andy Deas: All right, moving onto the questions.

Robb Wolf: Moving on.

Andy Deas: We're going to make progress.

Robb Wolf: Okay.

Andy Deas: First question Andy -- from Andy -- geez, I'm still out of it. My coffee is kicking in. A question from Adam, "Hey, Robb and Andy. Just thought I'd say thanks for the podcasts. Loving the material. I was just looking over an article in The Journal of Strength and Conditioning from last month. It was about a low carb diet being better for losing fat and maintaining muscle mass versus the standard low fat diet. Looking over low carb diets and even very low carb diets, some have between 10 and 30 grams of carbs a day or less.

How are people eating any decent amount of veggies in that situation? Even a spinach salad with broccoli and a pepper might add up to that much, and that's only one meal. I'm trying to connect being able to eat protein and fats essentially with reckless abandon while also consuming enough veggies and fruit to counter the acidic load of those foods. What do you think? Thanks again."

Robb Wolf: We get this question a lot and when we used to play more with the modified zone where we would take the zone, cut the carbohydrates in half, and add some more fat blocks and folks would kind of freak out about like, "Oh, my God! I'm not getting that much vegetable matter." But you are still -- even with -- with 30 grams of carbs a day level, you're

still getting, let's say three cups of broccoli which for some people it may be like, "Oh, that's not that much." But a lot of the work that Taubes looked at that some of the records of like the Inuit and all that sort of stuff, when we have our carbohydrate levels less, our need for various micronutrients like vitamin C, foliate, all these B vitamins, a bunch of these vitamins are cofactors needed in the processing of carbohydrates and it's kind of a dose response curve.

If you take in more carbohydrate, then you need more of these cofactors to process them. And so if you have a very low carbohydrate intake, you may in fact not need that much for these cofactors. Your relative amounts may vary based on your other dietary needs and this is also why grains are fortified and even when they're fortified if people eat too much of them, they can end up with various deficiency diseases. So it's an interesting concept but I think on a micro or macronutrient level, it's not that big a deal.

And then also folks are typically not living at a very low carbohydrate level indefinitely. This is usually kind of an intervention kind of gig where people are using it to reverse metabolic derangement trying to lean out. And I don't think there is any doubt that changing your insulin metabolism and getting leaner and better responsiveness to insulin is going to far outweigh only getting three cups of broccoli in on a given day. And when we start considering the acidic load, it's another kind of transitory situation. I just don't think it's that big a deal in the short term. If you start getting some serious sleep disturbances or some other problems, that may be an issue.

One of the things that also fixes all this is that when you're cooking your protein containing items, make sure that -- one of the drawbacks of grilling like on a barbecue is that all the moisture, all the minerals drip off of, say, like your chicken or steak or whatever and they're essentially lost, whereas if you're cooking that in a pan, you're keeping all of the mineral contents of that particular food. And this is some of the stuff like that nutrition and metabolism piece that talks about ketogenic diets and performance and they talked about Stefanson being on all meat diet for over a year.

One of the things they made sure to do is to include potassium and magnesium in the broth that they were given because that was one of the failings of all meat diets previously is that they would change the amount of minerals that would normally be found in that meat because of the preparation methods. So that's a whole chunk of stuff. But I just don't think it's that big of a deal in the short term. And then most folks

when they're tackling these very low carb diets, there's usually a cyclic element to it like you have points where you will pop up and have more fruits and vegetables down the road.

So I think the benefits far outweigh the potential downside and you're still getting in a fair amount of greenery in these situations. And again, keeping in mind that usually the folks who are doing this were reversing really, really severe metabolic derangement and I just -- there's almost nothing that you could do that is more beneficial than that.

Andy Deas: Good. I can't believe we got a question related to NSCA journal.

Robb Wolf: Thank God somebody is reading something, you know.

Andy Deas: Oh, I was going to make a comment about Greg Glassman at the chalkboard, but I'll leave it alone.

Robb Wolf: We'll wait for our parody piece that we're working on. That's a whole piece that we'll release at some point so... And then I will be shot and killed so...

Andy Deas: We will be thrown off the internet.

Robb Wolf: Yeah.

Andy Deas: All right. Cool. Next, we got a question from Meri. She wanted to know whether you've read the book Primal Body, Primal Mind by Nora -- I can never say Nora's last name so I'm not going to --

Robb Wolf: I have no idea either. Gedgaudas.

Andy Deas: Nora G.

Robb Wolf: Yeah, Nora G.

Andy Deas: She "recently read it and was quite impressed by it. It's almost in a line with the Paleolithic approach with some additional," at least for her, "info regarding longevity, such as: the more insulin you're body makes, the older you get. As in the opposite way: the less insulin you'll manage to get by the younger you'll stay (meaning naturally the different signs of aging such as cellular death, et cetera). This would translate, for example, into not drinking coffee due to its insulin raising effect and I know that you're, until proven otherwise, sticking with some quality espresso and full-fat cream.

So a bit confused here. Glad if you'd like to share your view on the scientific reliability of the book which I totally bought. I use the Paleolithic approach as the main tool when coaching my trainees into better eating habits and been now using the info from Nora's book as well." Also, she plugs, "Love your longevity, health, performance, trinity." I feel like we need to trademark that in some fashion for you, Robb. We have to come up --

Robb Wolf: Theoretically we did. I think we have Performance, Health & Longevity trademarked somewhere so...

Andy Deas: We'll have to find it.

Robb Wolf: We'll have to dig it up and find it, but I think we did do something like that so...

Andy Deas: The Robb Wolf triad, all right.

Robb Wolf: This is a great -- I have not read the book. It sounds really good. I think having not read the book, I'm assuming that what Meri is saying here is that this is basically a spot-on kind of Paleo endorsement. If we actually picked the book up and she's like, "Okay, eat bulgur wheat and quinoa and stuff," then I'd -- I'm throwing that caveat out there. I don't know that totality of the book, but by what it's saying, it's spot-on. And I wouldn't say that it's contradictory at all. This is very consistent with stuff that Eades -- Cordain hasn't touched so much on this, but if you look in the work of Volek and Veech,, the guy that I interviewed, metabolic control analysis in cancer, the notion that cellular aging is largely tied to how much insulin you are producing or how much you have produced, I think it's just spot-on. I can't really argue with that at all.

I talk about in the book a little bit about this tradeoff between -- when we're thinking about cellular aging there is a couple of different things that we need to consider. Cells will get old and wear out and then -- but we want to do that in a way -- ideally they last as long as they possibly can without becoming cancer. And then there are stem cells in our body which can replace these cells, but we have a limited pool of stem cells to work with.

And so this optimization of all of these concepts are basically trying to keep your cells as young as they can, as long as you can, try to prevent things from becoming cancerous or autoimmune, and then try not to burn out your stem cell reserve because the stem cell reserve is what's

going to replace cardiac tissue when it gets damaged, probably most importantly brain tissue when it gets damaged or you lose neurons or different elements of the brain because of just oxidative stress or because of an impact, trauma, or something like that. And this all kind of a dicey interplay to get some optimization out of that.

And then when she ties this in with the coffee thing, I mean I for a long, long time did some serious justification of my coffee consumption because I was in middle stage adrenal fatigue and couldn't function without it. I was pushing a lifestyle that wouldn't support -- functioning without that stimulant. And so I basically have -- I've seriously cut back. I'm probably about like four shots of espresso a day and then it's like mint teas and stuff like that afterwards and I feel a ton better.

And when I go to train, if I'm running flat, I don't dose with more caffeine just to getting up. I just train with what I've got that day and I stay within my means. And all of a sudden I've been putting on muscle mass and getting leaner and getting healthier and all that sort of stuff and/or someone who's almost 40 and has burned the candle at both ends, I think that's huge. And it's really, really important to remember that that cortisol axis really potently stimulates the insulin axis. And cortisol is antagonistic to insulin sensitivity both directly, cortisol acts on insulin receptor sites making them less sensitive to insulin, and indirectly because cortisol raises blood glucose levels and if blood glucose levels are up, then we have to release insulin. And so elevated insulin levels are also going to down regulate insulin sensitivity.

So there's multiple factors here and this is -- if you can read between the lines in *Lights Out: Sleep, Sugar and Survival*, they're talking a lot about low stress emulating the conditions of fasting by a ketogenic diet, moderate protein, higher fat kind of diet, smart exercise that isn't making you see white buffalo in the sky and think that you're dying because of the cortisol element of it and that should be very, very consistent with health and longevity kind of focus. And they like the coffee for the antioxidant effects. I like the coffee for the antioxidant effects and it has some detox elements on the liver. But again, it's a dose response curve like I would go very, very moderate on that. It's a lot less coffee that you can tolerate than what you would otherwise want. But it's a great question. It's really interesting stuff.

Andy Deas: Nice. Yeah, I'm going to have to put this on my list of books to read. I actually have not read it although I read her blogs so...

Robb Wolf: Oh, cool. Shocker. Andy reads like 600 blogs so...

Andy Deas: Currently, I'm rotating none of it, Robb, so...

Robb Wolf: Yeah.

Andy Deas: Anyway, good question.

Robb Wolf: Good question from Meri. Yeah, good stuff.

Andy Deas: Yeah. And maybe we'll revisit it once we get the book. We'll get the book and read it, and we'll kind of see if there's anything contradictory. But her blog is right in line I think with the kind of our world views. So I assume the book is the same.

Robb Wolf: Cool. Cool.

Andy Deas: Anyway, next, we got a question from SB, "Hi, Robb. Awesome podcast. I listen while doing my post-workout stretching." Look at this. See, someone else stretches a lot. I like it.

Robb Wolf: Mobility work, baby.

Andy Deas: It works. "I was wondering, I have heard you recommend 2000 or 5000 IU of vitamin D for various medical issues. I am 20 and have severe osteopenia due to I guess the female triad because of irresponsible training in the past. My doctor, who I am not impressed with due to her seemingly lack of concern, never made any nutrition suggestions. Just put me on meds and suggested calcium and vitamin D. I take 1500 mg of elemental calcium a day and 1000 IU of vitamin D before bed.

Should I be taking more? My training and nutrition (been following Paleo and listening to your suggestions on the podcast) is appropriate now. I will be getting another bone scan in a few months and I hope to see an improvement, if at all possible. If not, I just hope I have not slipped into the osteoporosis category. Will more D3 help?"

Robb Wolf: It's tough to tell whether or not the additional D3 will help give -- and I'm glad she mentioned the female triad deal. If she has suppressed her estrogen production, then no amount -- just ramming more D3 into her system isn't going to improve her bone density. This is where all of this starts fitting together very synergistically. The estrogen is vital for that normal bone metabolism particularly in a non-menopausal kind of state. If she is overtraining -- before she mentioned her food and all that and I was thinking, okay, if this person has some GI irritation, the kind of

standard high carb, low fat kind of gig, if the gut lining is irritated, then you're neither absorbing the vitamin D that you're supplementing. You're not absorbing calcium, magnesium, any of that sort of stuff. It sounds like she's probably squared away there.

The D3 might help a little bit, but the more important thing here is that the training level is probably brought back within a non-dangerous, non-stressful level and obviously like weight bearing type stuff being the preferred method of training, sprint type activity, and then bringing the overall activity in the levels where she ends up regaining a normal menstrual cycle. She has a normal menstrual cycle. We can pretty much assume that estrogen levels are probably within normal balance and then that way everything will come together pretty nice.

And then the focus on the calcium supplementation like you really want a lot of alkalizing vegetables and fruits in the mix, again that -- we linked to it episodes back, but you just Google Paleo acid-base and there's a page on the PaleoDiet.com website that Professor Cordain did that is really helpful in explaining the importance of acid-base balance, vitamin D. But also the fact that we don't necessarily need to hammer the body with a bunch of calcium, we just need the right cofactors in there. And it's actually more of a calcium -- magnesium plus calcium we should be looking at instead of calcium as the main player to reverse this whole process.

Andy Deas: Cool.

Robb Wolf: So the answer is I'm not sure but tackling the whole -- the problem holistically will definitely yield some results. And if SB ends up getting this and tweaks the training and see some significant changes, it would be interesting to see if she has ever tracked free inbound estrogen, estradiol, that whole scene to see where that's at currently and where it changes to. And if she hasn't done that, just tracking it later would be really interesting and then see what the bone scan will show.

Andy Deas: What's your thoughts on the vitamin D tests, Robb?

Robb Wolf: Oh, I dig them. They're good. They're a little bit pricey. So I've been slow sometimes to recommend them. And also people tend to be just so universally low. It's almost kind of a deal where it's like, okay, yeah, go ahead and get it check, but then just start supplementing anyway. Even if it's just around like a 1000 or 2000 IU, it's just -- everybody seems to be deficient in vitamin D.

Andy Deas: Right.

Robb Wolf: Yeah.

Andy Deas: All right. Good. Good question. Now, we got a question from Ryan. So this is a heaping long question. So I'm going to read the first part and then we'll have Robb answer. We'll make it through two paragraphs and then we'll go to the second part.

"Hey, Robb. Another great podcast. Thanks heaps to you and Andy for the work you're doing on the show and all the great information you're providing. It is very much appreciated and anticipated every week. I have a few questions regarding insulin and leptin. The first question is regarding the insulin response to larger meals and how much does it negate the enhanced insulin sensitivity brought about by decreased meal frequency? I'm asking because if we know the size of the insulin spike is determined by the composition of the meal, the size of the meal, and the frequency of eating there seems to be a fine balance between eating less often.

I'm not suggesting we go back to eating six meals a day, but I'm wondering if people who are trying to lose weight might be better off to eat say four meals instead of three because they would then eat less at each meal and have a reduced insulin response. Assuming the meals are evenly spread out throughout the day they could still get four hours between feeds and maintain some insulin sensitivity that way. Could there be a caloric figure per meal above which you may be better off inserting an additional feeding rather than taking in too much at one sitting?"

Robb Wolf: Holy cats! Well, if we get Barry Sears on here, then he would definitely buy into this thing and it would be a Twinkie in a small piece of steak and you would be set. This is a great and interesting question really when you get right down to it, but there have been some pretty good studies on this comparing the three-meal a day versus the six-meal a day approach. And the three-meal a day showed better glycemic control, better blood glucose control, actually improved muscle gain in an athletic population.

Rippetoe -- Mark Rippetoe had this linked and had a pretty nice study of this, just his own take on the whole thing over at the starting strength forum, and maybe we could link to that in the show notes. But I just -- I'm so impressed by the benefits of intermittent fasting and whatnot that I really think that three-meal a day kind of scenario is great and it's pretty liberating too. Something to keep in mind here is like if you want to be

shackled to eating four, six times a day, then by all means go for it. But I find it hard to even eat three meals a day given the amount of like just stuff I'm trying to get accomplished.

And so we don't really see anything compelling on this scientific side for a three versus four versus six meals a day. We don't see anything really compelling on just kind of the social side of making your life more complex and it's an interesting question of like attenuating the insulin size with a given meal versus frequency, but our bodies definitely seem better adapt at dealing with acute stressors than chronic stressors. And if in our kind of -- again, that ancestral modeling and all that that, if we were more wired up for like a one or two meals a day kind of scenario then the more we shift to that probably the more healthy we will be.

And I think where we see inflection points on this and this is my whole position on the performance, health and longevity and the triple point kind of view of this versus just simply work capacity across broad time and modal domains is at they are inflection points in which if you want, say, increased performance, that increased performance of whatever flavor whether it's playing hockey or being a body builder or getting to the John Welbourn 300 pound lineman size, that is going to necessitate activity that is deviant from the ancestral norm and there's probably going to be some potential downside to that and that's just the way it is.

And it's not a value judgment, it's just I think understanding that those are the reasons why we can operate within some pretty good parameters in performance and body composition and all that. But if you want to get particularly big, particularly muscled, you're going to have to eat more frequently than what a two or three-meal a day kind of scenario is going to give you. And the caloric intake level that is likely to not be particularly healthy over the long haul. Pavel has that great line in Power to the People. It's America, the land of choices. You can either be big or have a long life. And I think that this is kind of a nice illustration of that too.

Andy Deas: I also feel like for the average person, I feel like you just -- some of this just comes out the wash.

Robb Wolf: Yeah. It really does and having worked now with literally thousands of people between our gym and then consulting with folks elsewhere, just the insanity of trying to eat six meals a day or even four meals a day, it just gets nuts. And so to some degree if you're a coach or a trainer, what you are recommending to your clients, is it something that is all reasonable or you're just setting them up for failure right out of gate?

Andy Deas: Yeah. All right. "My second question is regarding leptin. You've mentioned it a few times on the podcast. I'd love to hear you talk some more about it because I'm a little unsure of the mechanism by which it regulates appetite and also how leptin resistance may in fact cause insulin resistance. I know leptin and..." How do we say this? Ghrelin?

Robb Wolf: Ghrelin.

Andy Deas: Ghrelin, thank you. See, Robb, that's why you're here. It's not to answer the questions. Just to help Andy learn how to pronounce things.

Robb Wolf: Pronunciation. Perfect. Cool.

Andy Deas: "...are both involved in appetite regulation but if leptin is a signal sent from fat cells to the brain to let the nervous system know how much fuel is in the tank, I would think it would take hours following a meal for the fat energy that becomes available to top off the fat cells by the time it is digested, absorbed, and directed by the liver. I'm thinking maybe ghrelin is more related to acute appetite regulation, i.e. the stomach is full, and leptin is more related to chronic appetite regulation, i.e. the fat cells are full or empty. Is this right?

I'm also wondering how leptin resistance may cause insulin resistance. I always thought insulin resistance was a simple scenario of decreased sensitivity brought about by too much insulin caused by too much of the wrong food too often. Do we need to complicate it by adding leptin into the equation? Or does it even matter if the fix for leptin resistance is no different from the fix for insulin resistance?" Go ahead.

Robb Wolf: That's a pretty good question and that's where James -- what's his last name? Krieger? Krieger?

Andy Deas: Krieger, yup.

Robb Wolf: Krieger. He was mentioning this stuff with NEAT. And so there was kind of this debate going back and forth like the Lyle McDonald camp saying, "Oh, it's all calories. All you Paleo nut swingers are retards and you don't know what you're talking about." And so James was kind of going after Gary Taubes and some of his assertions. And so he mentioned that NEAT, non-exercise activity thermic something. I forget what the acronym is. But that was explaining more the differences between obese and non-obese individuals than any other of this other stuff.

And then you dig around on that and that's kind of true but then the reality is that there is massive differences from one individual to the next whether or not they have a thermic effect from foods. Some people do. Some people don't. Some people eat a large meal and then they get kind of fidgety and twittery and everything and they burn more calories and other people do not. And so then it begs the question, well, what's the difference between those two people?

And I haven't done a ton of digging on this but when we start digging around a little bit, it looks like there might be a little bit of an autoimmune component to all that. And I still need to dig that up and I'm not 100% sure on that. But that is where this question -- it's almost like you just keep opening more layers and more layers and the ultimate fix ends up being the same. Neolithic foods at some level -- and this is kind of the interesting point of the Kitava study for -- maybe it's not so much a carbohydrate amount and it's more a carbohydrate qualitative issue that's the biggest factor here although I still cannot really tolerate carbohydrates all that much.

I cannot eat the Kitavan levels of carbohydrates and tolerate them. It doesn't work for me so I'm not super sure about that other than if I have somehow on an autoimmune level or something damaged, the leptin receptors in some ways such that it feeds into insulin sensitivity and it has damaged it and even just like my consistent gluten exposure because of cross-contamination might still be at risk here. I don't really know, I don't know that anybody really knows exactly how leptin is feeding into insulin resistance. There's definitely something correlative there but exactly how these things are working, we don't know. It gets massively complex very, very quickly like his question about short versus -- acute versus chronic fuel regulation.

When we eat a meal, our stomach stretches. When the stomach stretches, that releases a bunch of gastric hormones like cholecystokinin. Those things feed into leptin and ghrelin and insulin and then things like glucagon and insulin feed into leptin and glucagon and they all have feedback on one another. How exactly that works with regards to propagating insulin resistance, I don't really know. And reading all the review articles and what not and digging into it, I don't think anybody really knows yet and there may be some genetic variation within that.

The exercise -- I mean again this is massively complex stuff. The take home is if you are pulling the person away from the ancestral norm which is sleep exercise and kind of socialization stress levels that are on par with our ancestral norm, this is when we start seeing problems arise. And so

that's like the macro view versus the micro view which he's gotten for on this.

Andy Deas: Yup. All right. Good. Good question. With that, Robb, I figure we're actually coming up on an hour and we're trying to keep it an hour and keep your book moving.

Robb Wolf: Dude, do you want to keep Sarah -- let's do Sarah's question real quick -- Ms. Spinach just for --

Andy Deas: And I'm going to let you just handle it because this is where we get this -- Ms. Spinach's questions are so complicated.

Robb Wolf: Oh, wait. Oh, that's right. This is the IG one. Okay. We'll handle this one later and actually -- oh, God, I'm forgetting his name. I feel terrible. He is a PhD immunologist. He's wrapping up his PhD in immunology and he shot me his idea of what's going on with this, and we might need to do a whiteboard discussion on this one and actually draw a bunch of pictures because there's -- we need to draw some pictures of IGE and IGG and explain what the heck this stuff is.

It's a really interesting question though with regards to desensitization to different foods, but like his whole thing would -- he had a huge bolus of information on this topic. The desensitization, this is with regards to our last talk where we're talking about people getting desensitized to peanuts by micro exposures to this stuff. His take home was like don't eat foods that give you a runny nose was kind of the basic deal. If it's an irritant don't take it in. But we can look at for sure what the mechanism is with this.

But I think it literally would be helpful to have a chalkboard and to walk through what all these different immune factors are where they come from in the immune system like what immune cells and what they do on the cells because it changes the way that the cells end up expressing some of the inflammatory markers and all that and simply saying all this stuff is not going to help folks. I think you're going to need a picture to be able to keep track if at all.

So okay, we can wrap up with that one and we'll just -- we'll say to Sarah, Ms. Spinach, we will get to it and it will -- oh, man, it's going to be good so...

Andy Deas: It will be the longest answer to a question ever by Robb.

Robb Wolf: It will drive our listenership down to one person and that's because he's on life support and can't turn the damn thing off so...

Andy Deas: Well, Robb, I'm going to --

Robb Wolf: He'll say, "Please let me go."

Andy Deas: And I need to go, dude. You know the WOD number 5 from the Hawaiian sectionals, Jackie plus Karabel plus Cindy and see if I die.

Robb Wolf: Oh, just make sure that Keystone is your beneficiary on your life insurance so that's good.

Andy Deas: I will take good care of the cat I promise.

Robb Wolf: Right on, man.

Andy Deas: All right, Robb. Thank you and we'll talk to you next week.

Robb Wolf: Thanks, Andy.

Andy Deas: All right. See you.