

# The Paleo Solution

## Episode 21

Andy Deas: Robb Wolf, Andy Deas, back with the Paleolithic Solution, episode 21. How are you?

Robb Wolf: Good, man. We are legal drinking age now.

Andy Deas: I forgot about that.

Robb Wolf: The show is kind of like in dog years, and so by the -- we're going to be 70 here pretty quick and then dead so...

Andy Deas: Dead.

Robb Wolf: People will be like, "I'm totally over it. It's done. Kill it."

Andy Deas: Although someone on the blog made a comment about they were happy that it was sunny in Chico and the Kurt Cobain jokes were over because they are worried about the long-term health of the podcast.

Robb Wolf: Yeah, I was seriously considering the final option there for a while. So yeah, it's a good thing.

Andy Deas: On a movie topic, Robb, totally unrelated to what we do here on the podcast but I rewatched the Boondock Saints this week which is a cult classic. I don't know if you've ever actually seen that movie, Robb.

Robb Wolf: I have not taken that one in. No.

Andy Deas: All right. I'm going to have to loan you the DVD. Anyone on the blog that has seen the Boondock Saints II: All Saints Day that took 15 years to make, please post your thoughts because I'm going to go out and rent that over the next week, and I want to see -- I've heard some okay things about it. Anytime it takes 15 years to make a sequel you get a little nervous.

Robb Wolf: The Chinese democracy from Guns and Roses is a similar example in which high hopes but low follow-throughs so...

Andy Deas: Yeah, although I do recall seeing Axl on a -- before Chinese democracy came out one of the MTV -- maybe a movie awards and it was funny to

see the one skinny Axl Rose puffy, heavy with basically what would be almost dreads or really tightly braided cornrows and an Oakland Raiders jersey.

Robb Wolf: Yeah, he was kind of like a red-headed Gary Busey.

Andy Deas: Yeah.

Robb Wolf: It was horrible. Yeah.

Andy Deas: Yeah. So I have -- we'll see All Saints Day. I can't believe you haven't seen that movie, Robb. I'm going to loan that to you. I don't know that Nicki is going to like it, but it's on the list of things Robb may enjoy but Nicki will not.

Robb Wolf: We have little overlap in music and music -- music and movie so yeah, we'll see.

Andy Deas: Luckily, the cat ties you together.

Robb Wolf: We agree on the cat, yeah. If we ever divorce, I don't know who will get the haunch or the top so we'll see.

Andy Deas: All right. Cool. We have another good group of questions. Actually, this week, my question of the week is going to be question 1, Robb.

Robb Wolf: Sweet.

Andy Deas: So I'm kind of fired up about this.

Robb Wolf: Okay. No sneak attacks at the end when I think I've done perfect.

Andy Deas: Yeah. No sneak attacks. So I am going to -- this is multi-parts. So we'll read the first question and then let you start to answer from there and then we'll go through parts 2, 3, and 4.

Robb Wolf: Sweet.

Andy Deas: But I feel like our friend, Jay, is a little spun out after reading some stuff on Staffan Lindeberg's website so...

Robb Wolf: We had to ship Jay some clandestine antidepressants and anti-anxiety meds just to make sure he got through this thing because it sounded like there needed to be an intervention here.

Andy Deas: Yeah, the wheels have definitely come off for Jay.

Robb Wolf: Yeah.

Andy Deas: So a question from Jay, "Robb, I am having a major breakdown on the nutrition front. I just finished reading Staffan Lindeberg's website and he takes apart almost everything I thought I knew about nutrition. Here is the link." And we'll provide it in the notes." Here are my concerns. I've just included the important excerpt here but the whole piece at the link is crucial to read. (1) Staffan Lindeberg states, 'Hence, there is as yet no strong evidence that a low intake of fruits or vegetables is an independent cause of Western disease.' I know fructose in fruit can be problematic, fine. But vegetables? I've read so many studies suggesting vegetables are crucial to health for their antioxidant --

Robb Wolf: Polyphenol.

Andy Deas: -- polyphenol," thank you, "nutrient action. Most importantly I've read many articles and a book stating vegetables are our best defense against cancer."

Robb Wolf: Well, this one is kind of a meaty little chunk. An important thing to point out is that Lindeberg is an MD PhD. I think his background originally was in analytical chemistry unless I'm mistaking his background with Fritz Muskeit who is another Paleo researcher. If I'm getting him confused, I apologize. But Lindeberg is just a very thorough researcher, so what he's getting in and looking at here -- and I think Jay has misread this.

What Lindeberg is saying is that comparatively low intake of fruits and vegetables do not appear to be an independent cause of the western disease and this is from epidemiological data, some clinical data, and whatnot. Obviously, fruits and vegetables are healthy. But this is reminiscent of what we see in the Good Calories, Bad Calories where a lot of what we assumed to be nutrient like Recommended Daily Allowances and whatnot, vitamin C, B vitamins, these levels that we appear to need are very, very dependent on the macronutrients that we're taking in.

So if we're taking in a lot of carbohydrate, we're going to require more B vitamins and some of these other cofactors that are involved in the processing of the carbohydrate. If we're taking in comparatively little carbohydrate then we need relatively little and then vegetables has just kind of an independent entity and that providing significantly more nutrients than they do micronutrients than they do macronutrients. So

you end up with excess as it were of B vitamins as compared to the amount of carbohydrate that you're taking in typically.

So this is some of the stuff that's going on there. It's complex. But all that he's saying is that simply eating comparatively little fruits and vegetables is not going to give you hyperinsulism. That's what Lindeberg is saying in that statement.

Andy Deas: And this also reminds me a little bit of one of my favorite Kurt Harris blog post on the PaNu blog which was titled Plants and Plants Compounds are Not Essential or Magic.

Robb Wolf: Right. Right.

Andy Deas: Which I think is also pretty interesting to read and a little bit on the same line. So I actually posted a link to that in the show notes because I think it's worth consideration.

Robb Wolf: Yeah, totally. And it's just -- it is where this starts getting into -- it's not white hats and black hats. It's not good and bad per se. It's what are the roles that these things play biologically more than anything else? And are they novel like grains? And do they have problems associated with them then? Or is it more of an ancestral kind of diet matching? So yeah, the PaNu stuff is awesome and I remember that article. It's really good.

Andy Deas: Yeah, I think you also made an interesting point there that depending on -- well, I guess it's no shocker to us but depending on your macronutrient intakes it's going to affect the needs of things that you take in basically. That's said very poorly but --

Robb Wolf: Yeah.

Andy Deas: You know --

Robb Wolf: Macronutrients heavily influence your need for micronutrients as cofactors in their metabolism, and that's just a thing to keep in mind or crack out at a cocktail party as a means of picking up on somebody.

Andy Deas: That helps you pick someone up. You're at the wrong party.

Robb Wolf: Or maybe the right party. I don't know.

Andy Deas: That's a good point but --

Robb Wolf: If you found the one party in all the world where you might actually be cool so...

Andy Deas: Awesome. Awesome. All right. The second concern from Jay is that Staffan states, "One of the strongest beliefs held about healthy food is that fatty fish prevents heart disease, and that omega-3 polyunsaturated fatty acids are the main reason. However, the evidence is not by far as solid as it may seem." Jay says, "I don't even need to tell you how that flies in the face of everything I thought I knew."

Robb Wolf: Well, I think the point here when -- and again, when you read all of Lindeberg's work on this, he's just getting in and pointing out that you can get omega-3's from a variety of sources, that it's more specific to the ratio of omega-3 to omega-6 in the diet than anything just inherently magical about fatty fish. So again, if you pull these things out in isolation then you can make it look really confusing or contradictory. But it's pretty -- it's still very consistent with what we understand with all this stuff.

And part of the point that can be made here like in the Kitavan diet which is what Lindeberg has spend a ton of time researching, they do not intake very much in the way of omega-3's or omega-6's because they're taking in a significantly larger amount of saturated fat in the form of coconut. But the point there is that they still have an omega-3/omega-6 ratio that's approximately like a 1:1 or a 1:2. So it seems to be still more that ratio as the main issue that we want to keep an eye on and not so much the amount of fatty acids that we're looking at.

And then like Melissa and Dallas put together that fish oil calculator and they stuck my name on it which was very, very kind of them to do that, and the reason why we're recommending large amounts of omega-3's for people when they're sick is because they literally have pounds and pounds of omega-6 in their body that needs to get balanced out just to get the metabolism switched around. So that's a lot of why we're recommending that. It's more trying to fix a broken situation and then bring it back in the norms. And if your day-to-day intake of omega-6 is relatively low, then your need for omega-3's are relatively low.

Andy Deas: Yup. Good. All right. Point 3, Staffan states, "Although restriction of all types of carbohydrates may provide some benefit for subjects with diabetes type 2, it seems unlikely that dietary carbohydrate is a primary cause of Western disease." So Jay's take was, "Basically, I got that low carb diets are bull and we're silly for believing they are good for us unless we're already diabetic."

Robb Wolf:

Lindeberg's thing sometimes is like -- and Kurt Harris has his thing on it, "I am so tired of the Kitavans" thing and the takeoff I think from The Clash song. But this thing totally flies in the face of most of what we've kind of thought about hunter-gatherer diets and whatnot. Cordain has made the point that there was significant fruit and vegetables in the diet typically from the ancestral diet, but there was a larger amount of calories coming from animal sources and whatnot. But then you have the pesky Kitavans that pop in here.

And what we find is that they had a very high intake of dietary carbohydrate mainly from yams, sweet potato, fruit kind of sources, and they had essentially no metabolic arrangement and then they started adopting a more westernized type of diet with greater grain intakes. So it didn't really change the amount of carbohydrates, just the types and then these folks started developing metabolic problems which was really, really interesting. And then Lindeberg was the primary investigator on the first human trial of Paleolithic diet in type 2 diabetics. He was really, really slick in how he did this because the control group that they used was the Mediterranean grain-based, low fat dairy comparison group.

And so both of these groups are type 2 diabetics, one group is doing unweighed, unmeasured Paleo diet -- meat, fruit, veggies, nuts and seeds. The other group is unweighed, unmeasured a Mediterranean diet. Both groups are eating to satiety. The Mediterranean group found no metabolic benefit. They did not improve their oral glucose tolerance test at all, whereas at the end of the study for the Paleo diet folks, they were technically not type 2 diabetic anymore. They had reestablished normal glucose tolerance test. They had not really lost any weight not even around the umbilical measurement which is interesting because we put a lot of stock in that umbilical measurement as indicator of insulin resistance.

But when we start looking at leptin resistance and leptin resistance has it placed into insulin resistance then we may have some of the early stages of the insulin resistance reversing starting with the leptin resistance reversing and so that allowing normal insulin signaling in the Paleo diet folks. But this is a really important point which is that -- I think that there are some very, very healthy reasons for eating low carb particularly cyclically throughout the year. A lot of Volek's stuff seems to support this. There are just tons of information out there, all the information on hormesis and hysteresis, these different cellular processes of punctuated cellular stress causing an adaptation to that stress.

And I think that there is a bigger argument for limiting carbohydrate at various points. But what this research also points out is that people can and do eat higher amount of carbohydrates and they live just fine, but it's more often than not non grain-based situation like we seem to see much better results with the non-grain situation. Another good example of that is the Okinawan scenario. So it's an interesting piece and in some ways you'd like it to just go away because the story would be much simpler, but life is not that way for us...

Andy Deas: And I feel like we're on the Kurt Harris fan club today because I'm totally going to put -- I totally forgot about his "I'm so bored with the Kitavans" post.

Robb Wolf: Yeah, it's a great piece.

Andy Deas: That's awesome. So I'll put that link in for folks to read as well because I think that it's very interesting and well-written piece and it supports The Clash so they were --

Robb Wolf: I remember though Mat Lalonde was not a real fan of Kurt's piece there and I forget what the points were. And so when we get Mat on here, maybe we'll just stick in our brain maybe to ask him what his beef was with that because there were some elements of that that Mat did not like. Some of the -- I think some of the logic behind it. He was okay with the conclusion but the way that the logic was formulated he wasn't a fan. So it would be interesting to get his perspective on that.

Andy Deas: Yeah, we need to get the Mat Lalonde interview schedule so people can start to post questions.

Robb Wolf: Even more, people can worship all that is the Lalonde so...

Andy Deas: And maybe we should say then we're going to put the blog post up that we're going to have Dallas and Melissa from Whole9 on as well.

Robb Wolf: Yeah. When we know that show date, then we'll post a blog on that so that folks can ask some questions.

Andy Deas: And I think that it highlights one bias in our approach, Robb, is that we're only going to take men that are Canadian because it cuts down how many men could be on our show since Mat and Dallas are both from Canada.

Robb Wolf: Right.

Andy Deas: But we'll allow any women on the show.

Robb Wolf: Any women, yeah, yeah.

Andy Deas: All right. Totally off track. Number 4, Staffan states, "The Antioxidant story mainly emerged from intriguing hypotheses in molecular biology, but randomized double-blind controlled trials with antioxidants have essentially failed to show any benefit." Jay says, "I honestly believed antioxidants were beneficial for stopping oxidation of fats in my diet and body so that they don't wreak havoc on my body. Keeping cholesterol from oxidizing by eating vegetables seems like a good idea."

Robb Wolf: And it absolutely is. What Lindeberg is talking about is supraphysiological doses way above what we would normally get from dietary sources of antioxidants. And the theory was we can see damage accrue in both proteins and DNA that are from reactive oxygen species from free radicals that are generated either from cooking methods or high temperatures, UV radiation, like a whole host of sources, and these reactive oxygen species, these free radicals could then damage DNA protein and cause a lot of problems.

And there was definitely some understanding that things like superoxide dismutase which is our normal endogenous antioxidant enzyme like one of the most important -- one, it's not a hormone. It's an enzyme. Levels of SOD, superoxide dismutase, were very, very important in mitigating oxidative damage. And so the assumption was, well, if oxidative damage is bad, high amounts of antioxidant intake should be good. We should see decreases in various types of diseases, ranging from cancer to diabetes to heart disease.

But what we found was no benefit at high dose antioxidant intake and frequently an acceleration of the process like super high dose vitamin C actually being pro-oxidative and whatnot because none of these things are ever purely an antioxidant. Redox reactions, oxidation-reduction reactions, are -- there's always an uphill, there's always a downhill for the most part especially in biological systems. There's always something that could oxidize a reduced agent there's always something that can reduce an oxidized agent. If that's all a bunch of hoo-kadook for the people who don't have a chemistry background, I apologize. But it basically just means there's not a 100% answer as to whether or not something is antioxidant or pro-oxidant.

It's all relative to who else is in the neighborhood basically. And that has really big bearing on whether or not an organic system is going to be in a pro-oxidative state or an antioxidative state and what we find is that consumption of antioxidants from fruits, vegetables, even some of the meat, the grass-fed meat in particular gets full of various types of carotenoids and antioxidant compounds from the vegetable matter. That is a great way to puff up the antioxidant content of an organism because it's a variety of antioxidants and not just one flavor of antioxidant which is what historically been studied in these antioxidant trials. So that's why still eating a nice varied diet is important for these antioxidant qualities.

Andy Deas: And Jay, I think we'll -- I think we've already concluded, but Jay finishes question by saying, "I just don't know what to do anymore. What the hell am I supposed to eat? What's good for me? It's not grains, dairy, legumes, or vegetable oils. In most cases it's also not nuts, fruit, or eggs. Now I've been told it's not vegetables or fish oil either. Oh, and carbs don't matter anymore either, eat as many as I want. However, they can only be tubers. Do I just eat meat and tubers? Sorry for the long post but I'm falling apart."

Robb Wolf: It's horrible to laugh at somebody losing their mind. But yeah, that's pretty much it. Eat meat, fruit, veggies. Have some tubers. If you feel like the tubers don't work for you, then stick with the meat and veggies. I'd wrote a quick answer to Jay and it's still basically nothing has changed here, only our understanding has deepened a little bit. But the clinical implementation, nothing has really changed with this.

Andy Deas: The sky has not fallen.

Robb Wolf: Not yet. But really good question. I mean it's an outstanding question and it's -- the amount of information that we have readily available these days is just staggering. I was emailing Mat Lalonde about something. I forget if and what it was and then he pointed out -- I think I said something about you don't see much insulin resistance in the Maasai talking about their intake. We're trying to figure out how or if dairy would cause some insulin resistance related to leptin resistance and all this.

And I say, "Well, you don't see much insulin resistance in the Maasai." And then he said, "Yeah, but the cattle that the Maasai used are considered an A1 type of cattle," or an A2 I forget. There's an A1 and an A2. One of those varieties, the variety that the Maasai used which is an older variety of cattle, the type of casein that it makes is less insulin spiking and just generally less problematic. And so that's possibly part of

the situation they have going on. But I was like, "where the hell did you find that?" And he was doing some research on casein.

And so it's just this thing where if you're not on all the time, just constantly poking around on the research, you just get buried or you decide to find one area of expertise and call it good. But when you're trying to keep as much of an eye on strength and conditioning and Paleolithic nutrition which is like this just gargantuan field all the way around, it's a lot to stay on top of.

Andy Deas: Yeah.

Robb Wolf: The questions that people ask continue to get more and more complex. At some point, the questioners are going to have to beat the answers because I'm not going to know what the hell I'm talking about at some point so...

Andy Deas: Yeah. And seriously, Jay, right on for asking an awesome question like I saw this and I was like, "This is a good question." The Lindeberg stuff, it's good. It just needs to be taken in context to have the bigger picture.

Robb Wolf: Yeah, totally.

Andy Deas: Cool. All right. Next, we got a question from Barry. He says, "Hello, Robb and Andy. Thanks to iTunes. I think I am now caught up on all the podcast episodes and always look forward to the next one. I hope the weather is looking better up in Chico since all those Cobain jokes are getting me worried about the future of the podcast."

Robb Wolf: We're good. We're good. We're on the other side now. We're good.

Andy Deas: We are okay. And thank you, Barry, for making it through all those episodes when the sound quality is way worse than it is now. I get scared every time my iPod on shuffle hits like episode 2 and I'm like, "Wow! This sounds bad." I don't know why anyone actually listens to this.

Robb Wolf: I'm still not sure that anybody does. I think we're pulling my leg, but we'll run with it anyway.

Andy Deas: That's right. We have one or two people that actually listen to it. So anyway, two question for us, "both of which you may want to save for the supplementation podcast." Techno, we're going throw him in today --

Robb Wolf: Sure.

Andy Deas: -- because anything related to CrossFit Journal, Robb Wolf will get spun up about.

Robb Wolf: And Andy Deas is all about creating a spun up Robb Wolf.

Andy Deas: That's right. Turkish get-ups.

Robb Wolf: They did Turkish get-ups in my gym the other night while I wasn't there.

Andy Deas: Anything to spin up Robb is well worth the effort. So question 1, "Would you be willing to comment on the recent piece in the CrossFit Journal by Chris Mason on post-workout nutrition ("Optimized Post-Workout Nutrition for the CrossFit Athlete")? Leaving aside the conflict of interest inherent in the article, he recommends a whey-casein blend shake as the ideal post-workout meal, which is conveniently a product that his company manufactures and sells, I wanted to hear your take on two issues he raises in the article.

First, the issue of preferring liquid over solid food for immediate post-workout nutrition. Mason argues that 'The faster you can make amino acids and glucose available to the muscle cells, the greater the potential workout recovery response,' and that since 'liquid meals are normally digested and absorbed at a slightly quicker pace than a comparable solid...' Oh, geez, man. I'm falling apart here.

Robb Wolf: We need to quit drinking before this thing.

Andy Deas: I know, man. And I'm well within my coffee dose today. "...solid-food meal and that the post-workout shake is a superior choice." So let's start with that.

Robb Wolf: The podcast died on episode 21. We're done, folks. We're out.

Andy Deas: Andy can no longer read simple English. Anyway...

Robb Wolf: Okay. So the question here or I guess the assertion is that liquid food is good because it causes an insulin spike and insulin spikes post-workout are good because it enhances recovery. And these suppositions are very, very subjective. In some situations, liquid food is of benefit. In some situations, post-workout insulin spike is of benefit. But it is by no means the across the board answer as we have seen again and again and again. And I wish that this was just the simple one-stop shop. It's like high carbohydrate post-workout meal done but it's just not the case.

Anybody with an inflammation issue, they would be better off not spiking insulin post-workout. Anybody who is still trying to lean out, they would be better off not spiking insulin post-workout. Anybody generally who is trying to lose body fat would be good not to spike insulin and would be well served not to take in any dairy because of the inherent insulin spiking characteristics of the dairy. So it's just very -- and again, you see this pretty across the board.

I don't want to hang myself here by saying, if you start recommending -- if you have a food interest, then you're going to start recommending a specific food because obviously I've got an interest in Paleo brands, but I've been recommending like whole food since the beginning of all this and this is largely the reason why I haven't been able to really get all that solidly behind post-workout liquid type things like the shakes because I see them hamstringing and hurting as many people as help.

And particularly when people are always looking for a shortcut and when you're just looking to sell people product then it gets really easy to slide down that slippery slope and be like, "Ah, it won't make you fat. It's fine." And so there's just a bunch of stuff with that. Post-workout carbohydrate, post-workout insulin spiking is not always the most important thing to do. There's a lot of other ways to tackle it. We've talked about that in I think podcast 1. I've got several written blog posts on post-workout nutrition. There are a lot of nuances to it.

The other thing that is really, really interesting to me in this whole scenario, let's say that, yeah, okay, post-workout nutrition is the cat's meow. It is absolutely the way that you want to go. He recommends a post-workout casein and whey protein shake. What's in whole milk? Casein and whey protein. What's in whole chocolate milk? Casein and whey protein with extra carbohydrate. It's not maltodextrin so you do have some of that nutrient partitioning issue. But there's some very well done literature that compares all of these different kind of jiggy post-workout shakes with simply milk or chocolate milk and the milk and chocolate milk consistently outperform the shakes.

Andy Deas: Yeah, and this is one I think for us we're like dialing your nutrition, whole foods, get all that stuff figured out possibly, probably get as lean as you want, and then you can start playing with this stuff and actually have a reasonable idea how it is affecting you positively or negatively.

Robb Wolf: Yeah, yeah, absolutely. Yeah.

Andy Deas: Yeah.

Robb Wolf: So if you want to play with this stuff -- again just to recap but this is all back in episode 1 and the other post-workout things. If you're a lean stud athlete whether male or female and you want to tinker with some ways of improving your recovery, by all means check out some sort of liquid nutrition. But if you think something is inherently better in a shake than it is just from standard milk, in my opinion, that's absolutely false.

Andy Deas: Yeah. All right. Good. Question 2, "T-Nation is currently making a big deal about the BioTest 'Flameout' Omega-3 supplement. Their big claim is that the EPA and DHA levels are more balanced for men's metabolism, sort of like secret deodorant in reverse?" which is an awesome, awesome --

Robb Wolf: Analogy, yeah.

Andy Deas: That's just so good. "Is there anything to this claim that men need more DHA than women?"

Robb Wolf: Unless there is something that I am completely unaware of, I can find no recommendation for that. There's been some talk about should folks generally have more DHA than EPA because of some anti-inflammatory issues and whatnot? I think Garrett Smith makes a point that he's mainly shifting towards just doing an algae-based DHA supplement because you can get back conversion of DHA in the EPA on an as needed basis. That seems fine to me. I see no problem with that.

But the reality is that women, I could almost make an argument, would need more DHA because if they are pregnant, lactating, any type of scenario like that, their DHA demands are going to be much greater than a male's demands. So unless there's some nuance of testosterone metabolism or something like that, it's very, very DHA dependent that I'm unaware of, I would say a woman's need for DHA is higher than a man's. And particularly if we were to extrapolate this over a lifetime, for sure a woman's need for DHA is going to be heavier childbearing, breastfeeding and all that of stuff.

Unless there's -- I'll do a little poking around on this but I did some initial research and I just couldn't figure where they were coming from on this. So I would say bunk on that one. Busted, is that the thing on MythBusters? Busted? I will like it, yeah.

Andy Deas: All right. Secret deodorant in reverse. That is genius. I never considered that. That's so funny. All right. Moving on. Question 3 from -- I'm going to go with Mostyn.

Robb Wolf: Mostyn, yeah.

Andy Deas: Okay. "What's your opinion on raw food? As to my knowledge our ancestors lived primarily on raw foods. And whether cooked foods are harmful to our body, what's your opinion?"

Robb Wolf: It's pretty clear that a big change in our metabolism happen when we started actually eating more cooked food. There was actually a decrease in the size of the gut, decrease in the dentition, how robust our teeth are, and that's been a key part of our development. There's also no doubt that we've had significant amount of raw food in the diet too. And the simple answer here is we're wired up pretty nicely for a mix. And I just kind of wrap that into seasonal eating. It's really not that complex and I don't see -- the raw food people -- it's kind of funny because when you make the point that food is more easily digested, they always make the argument that if you cook food, it inactivates the enzymes that break down the food.

But even though there are autolytic enzymes in various foods like in grains and in meat and all that sort of stuff, enzymes that are inside the organism itself, it ends up breaking part of the organism down when we eat it. Our digestive enzymes are far more powerful with regards to that ultimate digestive process. So these things are really not that big a factor. And then when you point out the fact that the glycemic index or the ability to digest foods are dramatically enhanced with cooking because the fundamental part of cooking like you crystallize starch granules which make them more available for amylase to work on them. We end up breaking down the quaternary and tertiary structure of proteins and so make them more available for the pepsins and various proteolytic enzymes to break down the proteins.

It is obvious that cooking makes it easier to break stuff down. We get higher blood glucose concentrations on the same foods whether it's cooked versus raw. So it's obviously easier to break this stuff down, our certain nutrients destroyed in the cooking process. Yes, there are other nutrients that are only absorbed when we cook them like a lot of the carotenoids are dramatically enhanced when we cook them and when we consume the carotenoids with fat. So again, there's not a perfect easy answer to that.

Andy Deas: Yeah, and I think a book for consideration would be *Catching Fire: How Cooking Made Us Human*.

Robb Wolf: Oh, yeah, yeah.

Andy Deas: Richard Wrangham maybe is his name. He's like a biological anthropologist. I think he argues that we have evidence of up to like almost 2 million years ago.

Robb Wolf: Two million years, yeah.

Andy Deas: Yup. So anyway... Raw food. No comment.

Robb Wolf: Sushi is good. Sushi is good.

Andy Deas: Oh, for sure, yeah. But I would need that for every meal. Maybe I would but...

Robb Wolf: Yeah.

Andy Deas: Moving on. Good question. A question from Lauren, "Hi, Robb and Andy. I really enjoy the podcasts. I noticed Trader Joes is selling a resveratrol supplement. It's a little pricey for my budget but is it something worth taking? My goals are to lean out a little bit, get stronger. I already eat Paleo, CrossFit four to five days a week and sleep 8 eight hours a night, et cetera."

Robb Wolf: Dude, you're sneaking in all these stuff in the questions.

Andy Deas: I know.

Robb Wolf: You bastard.

Andy Deas: It's part of my spin-Robb-out day.

Robb Wolf: The resveratrol is super cool stuff. The studies are really interesting. The problem is the absorption on it is terrible. There are some lipolyzed products where they bind it to a phospholipid carrier and it seems to enhance the absorption. If you've got the cash and you want to throw down for it, take it with a fatty meal. I mean it's really good interesting stuff. It's still just inconclusive whether or not supplemental levels of resveratrol do much of anything. I think the main studies that they showed some really enhanced uptake was actually like an injectable form of it and that seems like kind of a bugger to me. It's tough to super duper

endorse it because it's tough to absorb but it is good. Resveratrol is super cool, interesting anti-aging properties preventing cellular senescence and all that. It's cool stuff.

Andy Deas: So Robb, actually the reason I put this question in because I like part 2.

Robb Wolf: Part 2? Okay.

Andy Deas: Yeah, which is back to our artificial sweetener problem.

Robb Wolf: Sweet.

Andy Deas: So second question, "I tend to chew a lot of gum and drink diet root beer two times a day. I also enjoy a diet peach Snapple every once a while. In your experience as a coach/trainer, have a lot artificial sweeteners significantly halted weight loss? Can you recommend a replacement?"

Robb Wolf: As to whether or not it halts weight loss? Yeah. I mean it's one of those things when we're trying to lean somebody out, if they are stalling, this is just like that inevitable thing. It's kind of funny like some people who are naturally lean -- there are some people who are just lean no matter what. They do whatever they want and they're kind of lean and we all hate them. And then there are other people who are pretty lean, pretty muscular and they just have migrated towards all the right stuff.

And then there are other folks that are on the other side of the spectrum where they "always had weight problems." But then when you look at what they're up to, the sleep is bad, they've got a ton of artificial sweeteners, they're still eating pretty processed food, and all that. And this is just one of those weird things that people were trying to lean out and they get stalled like, how's your sleep? How much dairy is making up your protein source? Are you doing artificial sweeteners? And what's your kind of basal stress level? And those things can bugger fat loss.

We understand pretty well -- there was just a recent study that -- and I've made this point the whole like food porn, just simply looking at food for some people can release insulin. They just had a study where folks were told to simply anticipate a meal and they started releasing insulin. So it's - - the bottom line is if you're trying to lean out and you're doing artificial sweeteners, you're probably shooting yourself in the foot. If you're already lean and you don't feel like the artificial sweeteners are causing you a problem, God love you. Go for it. Do whatever you want to do.

Andy Deas: And I think it's just funny like how addictive some of this stuff is. I have a client. I've trained her for a while and she's been off like diet soda for maybe almost three months and she -- it's literally like alcohol for like you talk to her and she's like, "Andy, I will still sit around the office and think about my Diet Cokes."

Robb Wolf: Yeah, yeah.

Andy Deas: And so the fact that someone even asks this question, I'm like, "Take it out and see what happens. What's 30 days?"

Robb Wolf: Yeah. Or can you take it out.

Andy Deas: Yeah. Can you actually survive without your two diet root beers? I mean, shoot, I'd love to drink some root beer too sometimes but it's not going to help.

Robb Wolf: Yeah, yeah.

Andy Deas: All right. Good. Next, we got a question from Matt. He says, "Hi, guys, Love your stuff and love the Paleo/CrossFit lifestyle. There's a problem though. One, my sleep has gone into the..." I'm not going to say this word because we're trying to down our swearing, so his sleep has gotten bad for sure.

Robb Wolf: It's gone on the skids.

Andy Deas: Yes, thank you, Robb. It's on the skids. "I'm sure that it's not over training since I'm not at the WOD stage and am doing basic stuff 2 on 1 off for no more than 30 minutes at a pop. I can fall asleep no problem. I have turned into a very light sleeper and wake up constantly all night. Part two of this is also the problem. Since I went Paleo about three months ago, I have developed night time lower leg cramps. Stretching before bed helps, also started taking vitamin E at night in addition to magnesium and zinc during the day. All with as much water as I can remember to drink. That's all for now. Keep up the great work and thanks."

Robb Wolf: When you're saying basic stuff the 2 on 1 off, I'm guessing that means strength work but I don't know for sur. If it still means like metcon type stuff that are no more than 30 minutes a pop, then that may be the problem right there. So for Matt, some clarification like what is it that you're doing? Folks still just don't get that these long 30-minute metcons and stuff like that, you're really doing counterproductive work doing much of those. The classic singlets, couplets, triplets of CrossFit

yesteryear, that's where the money is and that's where the power is, that's where the adaptation lies, that's where the bulk of your programming should lie if you're trying to get ready for the CrossFit games or even just generally be fit and healthy.

So I'm unsure what exactly he means by the 2 on 1 off in less than 30 minutes a pop. If it's just strength work, then that's probably not the problem. If it's metcons for 30 minutes, then that absolutely could be the problem. With the leg cramps and all that, I mean he may just need some more fruits and vegetables thrown in the mix, a little bit of the Natural Calm, some magnesium supplementation.

Without seeing exactly what he's taking in, it might be a little bit hard to figure out where the electrolyte level is on all this. And there are -- again we still don't know for sure what he's doing with his legitimate level of activity. He may be actually doing a ton of work and the leg cramps are actually completely reasonable. But through trying the more fruits and vegetables, some Natural Calm, and maybe get back to us on what the actual workout schedule is.

Andy Deas: Yeah. And I feel like the Natural Calm, the magnesium before bed seems to make a big difference for folks as opposed to taking it during the day. I'd be curious addition to magnesium and zinc, I don't know if that's the ZMA thing if he's taking them separate. But I mean we like natural Calm because it seems to work really well for a lot of people and puts us to sleep.

Robb Wolf: Yeah, yeah, and just magically. So very, very powerfully.

Andy Deas: Yeah, and I think the 2 on 1 off 30 minutes a pop, I don't know if people are looking at like the dotcom WODs or whatever. But we have folks in our gym or even 30 minutes of effort when they start is pretty significant. I think it's all relative to where you are if you're a 21-year-old college stud, well, your tolerance is going to be a little different than if you're 45 years old and haven't worked out in 20 years.

Robb Wolf: Yeah, yeah. So yeah, the poison is always in the dose.

Andy Deas: Yup, yup. That's a Glassmanism. Stop saying that, Robb.

Robb Wolf: No, that's mine. That's mine.

Andy Deas: Okay. Oh, sorry, his is the "dose-response curve" which was stolen from somewhere else.

Robb Wolf: Yes.

Andy Deas: All right, Robb. You're close there, brother. You're --

Robb Wolf: You're just provoking me today. Man!

Andy Deas: I know I've had a lot of coffee. Well, I had it later in the day. I guess my 6 a.m. client canceled so I slept it a bit today so it's nice.

Robb Wolf: It's actually perkier today.

Andy Deas: Yeah, exactly. Perkier. Good squat session. I feel good. Question 6 from Derek, but this is a different Derek. Not our good friend Derek.

Robb Wolf: Not the 10,000 question Derek who we love.

Andy Deas: Who we love, exactly. "Robb, I belong to CrossFit Bernardsville," I have no idea where that is but I'll look it up, "and a decent CrossFitter. With my coach's help, I set up a Paleo diet plan with no fruit to help me lean down even further. I have seen dramatic improvements in my physique, but experienced an interesting issue. The second week on Paleo I felt like lactic acid was building up more quickly in my legs and I would burn out faster than pre-Paleo. Does this seem normal from what you have seen?"

Robb Wolf: Absolutely. Yeah, I mean you switch up the fueling, cut the carbohydrates down. That's totally typical. I have that blog post, The Zone and Athletic Performance and it talks about the transition from a carbohydrate base metabolism into a more ketogenic type metabolism and I draw really heavily off of the nutrition and metabolism piece looking at ketogenic diets and athletic performance. But what Derek's -- this is the thing. Derek is wanting to lean out so you may end up taking a hit on the performance side to be able to lean out.

Now, there might also be ways of leaning out and augmenting performance or at least supporting performance at the same time. But folks are so focused in trying to make everything go up all at once, and I think that there's also this sense particularly when people first get going in CrossFit or they just get going in training in general, everything does improve at once. It's called "the novice effect" and gains are cheap and easy. And then as you get further down the road, you need to really think about what the heck you're doing if you want to change any part of your game if you want to gain muscle, lose body fat, improve your 800-meter

run time. At some point when you've gone beyond simply being a beginner then you need to actually put some planning into this stuff.

So yeah, this is totally normal and this is just kind of indicative of you want to lean out so you're going to probably take a hit on your performance for a while. Then when you get to your level of leanness then you're probably going to titrate your carbs back up to a point where you see some really optimized performance. But it's that monkey hand in the jar analogy again. It's like you've got to be willing to let some stuff down to be able to make some progress in other areas.

Andy Deas: Yeah, and you also have to be willing to I think go through an adaptation period which most folks seem to forget.

Robb Wolf: Yeah. So for Derek we don't know if he's simply adapting to a lower carbohydrate level. And similar to a lot of folks, this may actually be where he runs best or we may be seeing him operating behind the curve but he's decreasing the carbohydrates so that we're controlling insulin, we're getting leaning out effect, and then he'll end up dialing the carbohydrate up for better performance down the road. It's too early to tell exactly where he's at on that though.

Andy Deas: Yup. All right. Good. All right. Next, we got a question from Anu, "Hi, Robb. What is your opinion on children going on the low-carb Paleo diet? Is it bad for children to be in ketosis? Any health detriments to children adopting a Paleo diet? And if they do eat dairy, whole milk or 2%? We're debating whether to introduce the girls to the Paleo with dairy that I follow and wanted to make sure that it's okay to do so."

Robb Wolf: I obviously --

Andy Deas: You're the new Dr. Spock.

Robb Wolf: Geez Louise! The kid thing always weirds me out because I know somebody is going to come and shoot me and be like, "You told me to raise my kids wrong," and you know, just -- oh, God! I almost don't want to answer kid questions anymore but... Kids are just little people. I mean once you get past like being an infant, infants don't metabolize EPA properly and they're still supposed to be breastfed. So to a degree you kind of get the -- that whole thing gets fixed like breast feed your kids as long as you really can and they tend to do good and the mom does well. There are health benefits for those.

And beyond that they're small human beings and so you feed them the way that large human beings that eat only smaller portions, and they're going to like some things and not like other things. And generally, if they are given good options -- meat, fruit, veggies, chicken -- all that sort of stuff, they find the stuff that they like and it's very, very hard to induce some sort of a nutrient deficiency in them. It's interesting though where - - Anu was asking about the ketosis. I mean a Paleo diet doesn't mean that it's ketogenic. So it's really important to kind of understand what these distinctions are.

Ketogenic is very, very low carbohydrate, moderate protein, higher fat. Interestingly on that front, ketogenic diets have been studied for over 80 years and children with epilepsy and it's still to date the most effective treatment for epilepsy known. It's far more effective than the drugs that are given for epilepsy and with fewer side effects. So on the simply ketogenic diet question, yes they are safe for kids they are used clinically a ton for a different epileptic type seizures. And then a Paleo need not be ketogenic. It can be plenty of fruits and vegetables.

And then on the whole dairy gig like if you think that the kids are missing something because they don't have dairy, in my opinion, that is completely false. They're not missing anything out of the dairy, and they may actually be doing much better without it. We can do a whole dairy broadcast at some point, but just the short answer is that they're not missing anything out of a dairy. If there's a perception that they're missing calcium or something like that, that is just absolutely false.

Andy Deas: And I think -- every time I do this we mention again Everyday Paleo from Sarah Fragoso who works with us at the gym who has her whole little band of children and her beast of a husband eating Paleo. I think it's cool to see how the kids eat, and I think it's a cool implementation. She doesn't make them crazy and they do great. They're studs.

Robb Wolf: Yeah, yeah, the whole family is super healthy and does great on these three kids, two Chihuahuas, and a spastic husband so yeah.

Andy Deas: So we'll put the link it although it's already on the blog roll but I'll throw it in the show notes.

Robb Wolf: Yeah.

Andy Deas: Awesome. All right. Next, we had a question from Zach, "Hi, Robb. I'm a trainer at BTB Fitness in Atlanta, and I attended your nutrition cert a few

months back." Oh, was that a cert or a seminar, Robb? I'm always confused.

Robb Wolf: Oh, man, they're all certs.

Andy Deas: "I've been doing Paleo for about four to five months, and I've been seeing amazing results. However, my girlfriend is complaining about really bad breath. She says it smells like 'Chinese herbs' and permeates the entire room. With your standard bad breath I usually know when I have it. However, with this I'm completely unaware. I read that if you eat too many nuts your body doesn't digest them and they rot in your stomach, so I omitted nuts for a few days, but it didn't help.

I also think it could be red wine (though doubtful because I don't drink that much) or maybe coffee. I think it's definitely a stomach thing, and I'm aware of some stomach grumbles when she complains about the bad breath. I've considered adding some yogurt to my diet, but really don't want to stray from Paleo. If you could give me any info I would be extremely grateful, and I'm sure my girlfriend and CrossFit clients would be, too. Thanks, and I look forward to hearing from you soon."

Robb Wolf: Wow! You got to some pretty good breath going if the clients and the girlfriend are complaining about it. So you better figure this one out ASAP. You definitely can get some different breath from different type of gut flora and that can change based on the amounts of protein, carbohydrate and fat that you're taking in, a more meat-oriented diet like what I tend to eat. You get a different type of bacteria then you do a more kind of fruit, yam, sweet potato kind of diet although I do not appear to have any problems with bad breath. But I also take probiotics pretty frequently.

So he definitely -- I mean the yogurt isn't that big a deal. If you don't want to use the yogurt, you could do raw sauerkrauts, just a simple probiotic. A new chapter in Jarrow both have really good probiotic formulas I recommend. If you do probiotics you use different companies like rotate through them because each one uses different strains. And so it's important to have as much diversity in the gut flora as you can. That would probably help. And then another wacky thing that you might try is a tough scraper.

A lot of people when they're doing their whole oral hygiene thing like they'll brush, they'll floss, but the tough scraper actually ends up removing a bacterial film that burrows into the taste buds of your tongue and can actually be pretty gnarly source of bacteria and fungi. So the

tongue scarper might be an idea too and you can just use a spoon for that but that might be something to throw in the mix once or twice a day and see if it helps.

Andy Deas: I can just see this guy's poor girlfriend seeing him in the bathroom scraping his tongue with a spoon. Maybe he should look into a legitimate tough scraper up.

Robb Wolf: Hey, if it works, then pull out all the sop so...

Andy Deas: Yeah. All right. Next, we got a question from Bill, "A quick question about maximizing effectiveness of carb intake on cortisol levels. In a nutshell, if carb intake is restricted sufficiently to require more or less continuous gluconeogenesis to maintain blood sugar, and cortisol is the pathway by which gluconeogenesis is activated, wouldn't eating close to zero carbs result in continuously elevated cortisol levels?"

Robb Wolf: Cortisol is not the only way to turn on gluconeogenesis. It is one way to do it but it's not the only way to do it. But the thought here is good and this is part of the reason why the intermittent fasting stuff is really interesting but also potentially very, very problematic because if you are in a fasted state and then begin training particularly at a high intensity level, then the likelihood of you releasing cortisol to prop up blood sugar levels is very, very, very high. So I was talking with Lon Kilgore the other day and talking...

Andy Deas: Robb.

Robb Wolf: ... that's how you can get into overtraining scenarios. You said "Robb"?

Andy Deas: Okay. So something happened with the internet connection so we lost you with "I was talking with Lon Kilgore the other day."

Robb Wolf: Oh, okay. Am I back?

Andy Deas: You're back. You're solid now. It was a brief blip in the wild west of the internet. Uh, maybe not. Hold on.

Robb Wolf: Dude, then you were gone for like 20 seconds.

Andy Deas: All right. Robb, I am here. Maybe.

Robb Wolf: I'm here to.

Andy Deas: All right, hold on. Hold on. Let's -- tell me story about...

Robb Wolf: A man named Ed, a poor mountaineer, barely kept his family fed.

Andy Deas: I'm going to shut down lots of stuff. This, Robb, is why -- I don't even know if this is recording. Kelly Starrett says coaching and to podcast are like performance art because we never know what's going to happen.

Robb Wolf: We never do.

Andy Deas: So we're going to close down a bunch of stuff. My iMac is a little cranky right now and I think we're recording. So you were talking to Lon Kilgore about overtraining.

Robb Wolf: Just cortisol levels that can be elevated from overtraining and one of the obvious places that this can happen like if we're doing intense mixed modal activity where we're using a lot of muscle mass intensely like basically taking things down to failure, we're causing a huge stimulus to uptake glucose into the muscles. If we clear all the blood glucose out of the bloodstream into the muscles we're going to really perturb the system. And if we do not have an easy way of replenishing that glucose, then we're going to stimulate the release of cortisol and adrenaline to release glucose out of the liver.

And so this is one of those things that when I'm looking back at my own problems with elevated cortisol levels, the a.m. training in a fasted state when I'm looking back at it and I was already stressed, already having problems, already overly caffeinated, and then throwing kind of fasted training on top of that, it's like "Oh, I was an idiot." No wonder I ended up producing the problems that I had. But if you're not massively stressed and if the type of activity that you're doing is not always super high intensity mixed modal type stuff, if it's more just kind of like strength training or kind of aerobic type stuff, it's probably okay. You can actually get a pretty good benefit out of a training fasted and kind of flying under the radar of that cortisol issue.

Andy Deas: Yup. And then part 2 of Bill's question, he says, "Likewise, to maximize development of muscle (occurring in reduced cortisol environment) wouldn't the ideal, though perhaps unattainable, diet be the one that provided just enough carbs to nearly eliminate gluconeogenesis, thus generating the lowest levels of cortisol due to diet (all other factors being equal)? Or is my understanding of this simply immature?"

Robb Wolf: I think that's pretty spot-on from the reality for maximum muscle development although I'm by no means an exemplary expert in this area, but the things that seem to go into it are insulin sensitivity. But then also getting away with as much carbohydrate as you can definitely has some growth promotion to it but different people have different levels of buy-in on how carbohydrate they can tolerate in this whole scene. The cortisol management piece is definitely really important from an androgen perspective also. If your cortisol is going up, testosterone is going to go down and it's going to have some other collateral damage effects including insulin sensitivity because of the elevated cortisol. So there are a lot of reasons for keeping cortisol in tight check.

Andy Deas: Yup. And with that, Robb, that ends the questions of the week. I am going to insert the crazy planche pushups video that Ido posted on the gymnastics body website because --

Robb Wolf: Awesome.

Andy Deas: -- it was insane and anything that makes Ido jealous mean to this nowhere near attainable for 99.9% of the rest of the population.

Robb Wolf: Exactly. But it is nice to see the Ido squirms once in a while about something.

Andy Deas: Yes. He is not perfect. There are some things he does not feel like he would be able to obtain which makes me smile.

Robb Wolf: Yeah, yeah.

Andy Deas: All right, man. Well, that's it, episode 21. We're coming in just under an hour so I think that's pretty solid.

Robb Wolf: Awesome.

Andy Deas: Thanks, Robb. I will talk to you again next week.

Robb Wolf: Thanks, Andy. See you soon.

Andy Deas: All right. See you.