

Paleo Solution - 374

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Robb: Hey, folks, Robb Wolf here. Six listeners can't be wrong. It's another edition of The Paleo Solution Podcast. Super excited for today's guest, Mark Sisson is the founder of The Primal Movement. He is an incredible personal friend, he's been a just amazing mentor to me, has given me amazing phenomenal advice and been a great friend, has supplied me a decent amount of wine and other goodies when I've had the good fortune to hang out with him at his house and other venues. And he is right on the cusp of releasing a new work called The Keto Reset. Mark, how are you doing?

Mark: Doing awesome, Robb, great to talk to you. We have so much going on in our lives, we don't get a chance to actually sit down and have that wine much anymore, so I guess we have to use these occasions to catch up.

Robb: I get it. Maybe we should be drinking wine while we do this. I hear Tim Ferriss does that a fair amount so we can multitask on this.

Mark: I could probably handle that, I couldn't handle the Rogan method.

Rob: I think he's been chilling out on that, I don't know if it was for fear of repercussions or what exactly, but yeah. So, Mark, what's new? You always have a zillion projects going on, your Primal Kitchen is launching both in the brick and mortar setting and ever-expanding product lines. Tell folks a little bit about that before we get in and talk about The Keto Reset?

Mark: Sure. The Primal Kitchen foods has been really taking off in the past two years, I mean, really taking off, I think we're in 7,000 stores right now. Our mayonnaise is the number one best-selling condiment in all of Whole Foods across the country, we're also the number one best-selling mayonnaise on Amazon. Actually, we're number 1, number 3, number 6, and number 12 on Amazon. And then we launched the salad dressings about a year ago, we have five dressings in the lineup now, and again, the premise is they're all based on avocado oil which is the healthiest of all possible choices you can make when you're making salad dressing or a condiment like that. The original intention was let's make sauces, dressings, toppings and snacks that people can use and that they can use with reckless abandon. So the mayonnaise was contemplated to be put on burgers and dip fries in it and normal uses of a mayonnaise, but it sort of all of a sudden put potato salad, chicken salad, tuna salad, egg salad back on the menu for a lot of Paleo people. So we've been killing it with that and crushing it, I guess, is the term that kids use these days, and having a blast with it. We've got a very

crowded innovation pipeline with lots of new products coming down so that's really been spectacular.

Then our Primal Kitchen Restaurants are taking off, we opened our first one in South Bend, Indiana about five weeks ago per this interview and it's just doing extremely well, very well-received there. Next week my kids are opening up the Culver City location that they've been building for about six months and that's been coming together really nicely, it's a beautiful location. Primal Kitchen Restaurants are breakfast, lunch, and dinner, fast casual, all the sorts of foods that you'd want to see in an ancestrally-aligned kitchen. We only use the best cooking oils, grass-fed meats, pastured eggs for the breakfast offerings. We have a lot of vendors in our café sections, so we've got the meat snacks, the jerkies and the bars and the grain-free granolas and the kombuchas and all that stuff, too. This is like one-stop shopping for anybody who wants to eat clean. And oh, by the way, it tastes spectacular.

Robb: That's a nice bonus, in addition to everything else.

Mark: So your audience will appreciate it but we're not even using the word Paleo in our marketing because we want to appeal to everybody who just wants to eat great tasting food and then, sort of as an afterthought, go, "Oh, you mean it's healthy, too? Whoa!"

Robb: It happens to tick the Paleo Primal gluten-free boxes just because that's the way they got all put together. No, that's genius.

Mark: Exactly. And now we've got one big built right now in Santa Cruz, near your old stomping grounds, and Portland, Oregon. And we've got about 12 more franchises that are looking for space right now. So it's very exciting, anybody who wants to get in to the restaurant business and look into becoming a franchisee, you can go to primalkitchenrestaurants.com. But we're here today to talk about my new book, The Keto Reset Diet.

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Robb: Outstanding transition, better than I was going for. I think both you and I kind of got into this scene with the gateway drug of low carbs/ketogenic diets. I know that that was the case for me. I seem to recall that largely being the case for you. Could you talk a little bit about that? And then clearly we've grafted on these kind of Paleo Primal concepts because it goes so much beyond what's on the dinner plate, the sleep, the exercise, the community, the gut microbiome, all these other features, but that was largely your entry into this whole story, right?

Mark: Absolutely! I got into this because I've had this obsession with burning fat. First, as an endurance athlete, always wanting to figure out ways to improve performance, knowing from an early age that it was by becoming a better fat burner, that I could manage my glycogen stores because that was the big issue for years and years was how do you continue to put glucose through the bloodstream in long events. And of course, everybody came at it from the wrong end, they said, let's just create these carbohydrate supplements, these glucose supplements that you can take every 15 minutes and cram 20 grams of carbs down your throat two hours, three hours, four hours into an event. And that was the MO for decades until just in the last five or ten years people started training for endurance on a low-carb strategy and said, no, that's the exact wrong approach, let's just become so good at burning fat that we don't need to supplement carbohydrate during an event.

Robb: Or very sparingly, yeah.

Mark: Or very sparingly. And so that was kind of my original entrée into the ancestral health world and Paleo Primal was kind of an obsession with becoming good at burning fat and keeping low body fat and tapping in to my own fat stores. And I created this carbohydrate curve that I got so much shit for ten years ago when it first came out, you know what, it's held up pretty damn well where I segmented 0 to 50 being keto and 50 to 100 being effortless weight loss, and then 100 to 150 grams a day as like okay, not many people would ever need to go above that, where you'd never find yourself going above that because if you cut out sugars, like you should, and soft drinks, sweetened beverages, cakes, candies, pies, cookies, all that stuff, and if you cut back on processed grains, at the very least, and whole grains if you've got any sort of issues, you already find yourself in that arena of low-carb.

So that's kind of where I landed 15 years ago and it was a very comfortable space for me. I had all the energy I ever wanted, I was like every once in a while I'd go really low carb and after years of doing this I've already built the metabolic machinery. And that's what I talk about in the book a lot is that it's pretty painful to go from 400 grams of carbs a day down to 20 if you haven't done some prior work on yourself, if you haven't built the metabolic machinery. And I've been keto for days at a time but not much more than a week, shall we say, over the past decade, partly because I just hadn't felt the need to, partly because I didn't know enough about the benefits. But when I got this great opportunity from Harmony to write this book on The Keto Reset Diet, I thought, now's my chance, I'll go deep into keto. So I did a two-month foray into keto and I was amazed. I thought I felt good already based on my diet, I felt better. I thought I had low body fat, my body fat dropped even more. I thought I was doing well with preserving muscle, I preserved even more muscle mass. What's interesting, I

needed less sleep. I literally wake up a little bit earlier in the morning, go, I slept great, I'm ready to wake up.

So for me, going keto was just sort of a logical next step, it was basically Primal 3.0. It was so easy for me to transition to keto because the truth is I was only dropping an additional 40 grams of carbs a day and that looked like night eating for me. I just gave up night eating and just was a little bit more diligent about conforming to my compressed eating window which has been for the last number of years, I eat my first meal at 1:00 in the afternoon, I eat my second meal at dinner at 7:00, and that's when I eat and I don't eat in between, and I wake up in the morning, I have all the energy I need, sometimes too much. I go to the gym at 9:30 or 10:00 and I do sometimes a hard workout, sometimes like a Lithic workout, sometimes a long workout. But, either way, I do it fasted, and then I get home and I go back to work and I don't eat for a couple of hours after the workout.

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And I started to notice, there's just such a comfort and ease that I've experienced when I've built such a metabolic flexibility, when I become so efficient at getting energy from whatever calories I throw at my body and that's beauty, it's one of two major benefits of keto. That is you become so metabolically flexible that you actually really don't need to eat -- I'm not saying that you don't choose to it, I'm just saying you don't need to eat because you're so good at generating just enough ketones, once you've adapted, to fuel the brain, the muscles become so good at burning fat they don't even need ketones and they don't need glucose. And so you start to exist in this whole new realm of efficiency and economy and metabolic flexibility and it's so eye-opening because to me, as a researcher, and you and I could talk about this offline, it opens this amazing philosophical discussion, like are we just not doing anything that's positive in a biochemical realm when we're eating, and is all the good shit happening when we're in between.

And God bless Art De Vany, who's been my mentor, and you have, too, Robb. And I've got to credit you, you've put a lot of cool ideas in my head. But over the years Art just comes up with these little nuggets and more recently, he talked about it's a very simple concept. He just said, I'm not that much into keto because I don't identify with that, but what I do is I just don't eat for long periods of time because I feel like it's that fractal stochastic human experience because I feel like all the repair and all of the good stuff happens when I'm not eating, because you've got the stuff stored in you. When you eat, yes, you can throughput in real time some calories, but there's a lot of accumulation. You accumulate some glycogen, you accumulate some stored fatty acids, you accumulate some sugar in the fat cells, and all of this stuff is basically getting you

ready for the good stuff that happens when you don't eat. I don't want to get too far down this--

Robb: No, no, no. All six of The Paleo Solution listeners are fairly adept to this stuff.

Mark: You said the word nine, come on.

Robb: There might be nine at this point. A few people have had kids, so yeah. But Art is a really interesting example of this because, man, you and I have seen and been the subject of quite a number of pissing matches and so you know people will say keto is the default mode of humanity, that's the way we always ate, and other people say, no. And what's interesting, I think so much of what Art has done is kind of this like cutting the Gordian Knot. It's kind of like, okay, maybe we did or didn't eat keto ratios but if you are active and you go significant periods without eating which is pretty much the human experience, then ketosis was a constant companion.

And Nicki and I did a little bit of n equals 1 self-experimentation, we've always known that the gist at a gut level that Nicki was probably much more insulin-sensitive, metabolically-flexible than I am, and we ate the same amount of carbs, we did some blood glucose testing, her blood glucose responses were much, much better. And then we cut the carbs and entered into ketosis and my dandible wife, she was like a 0.8 to a 1.0 which again, we can't completely wrapped around the axle of the ketone levels and maybe we could talk about that in a bit. But she transitioned into ketosis smoothly, flawlessly, no dip in energy and I think that this really goes back so much about what you've already mentioned and what you talked about in The Keto Reset, which is this metabolic flexibility, it shouldn't be like hitting a brick wall, shifting from a somewhat carbohydrate-dependent metabolism to a fat-dependent metabolism.

There's a great paper called "Secrets of the lac operon" and it really goes deep into this stuff. And that seems to be so much about what you're talking about but a lot of people, myself included, are due to who knows what total reasons but maybe the mitochondria have been damaged from antibiotics, maybe it was too much glycolytic load in my powerlifting days, who knows what, but that transition is rougher for me. What are your thoughts around all that stuff?

Mark: Well, it certainly comes back to bio individuality, certainly we share the same DNA that allows us to burn fat or store fat, to build muscle, to improve immune function, but it's just the degree to which we do that differs among individuals.

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So you might say if I'm going to go keto and I've been a person who's been heavily-dependent on carbs for the last three decades and I've done some

metabolic damage that way, it might take you more than three weeks to get ready to go into ketosis. The book is called *The Keto Reset Diet: Reboot Your Metabolism in 21 Days and Burn Fat Forever*. The truth is, some people might take a little bit more than 21 days and we have a midterm exam that you take in the book that's halfway through the book. After you prepared through this 21-day transition, there's a little bit of blood testing and stuff like that, but we rely more on how do you feel. So when you wake up in the morning do you have enough energy to go a couple of hours without eating breakfast, if you've done that can you do a mild workout and not feel lightheaded or suffer the consequences. So we have some very subjective means of looking at whether or not we feel like you're becoming fat-adapted and hence prepared to be keto-adapted.

And yet we might find some people like myself who have been so low-carb for so long, and I would call anything under 150 grams a day reasonably low-carb, so the shift wasn't that big a deal to me. Again, it's like removing another 40 or 50 grams of carbs a day which I probably didn't need in the first place because they probably took the form of some Paleo dessert or something that I was eating that was 40 grams of "appropriate" sugars. So everybody kind of has their own little unique personal history and bio individuality and familial genetic predispositions, all that stuff does come into play. But I suspect that everybody ultimately can benefit from a keto reset. Now the term "reset" was used specifically because I'm not necessarily advocating that you live your life in ketosis, that's not the point here. The point here is metabolic flexibility, and I'm offering a keto reset as a choice, something that someone might do the same way they might do a cleanse once a year or some other health strategy on a New Year new you January 1st resolution kind of thing.

And so I'm looking at it as using keto as an opportunity to up ratchet your metabolic flexibility so that for the rest of the year no matter what you eat, you're likely to be more efficient at burning fat, you're likely to be literally more efficient at burning carbohydrates, too, less of the metabolic fallout that the reactive oxygen species. Because this is really about one of the benefits is about building more mitochondria and so becoming more metabolically-efficient because the body knows how to extract fat from your fat stores, or from your food, and use that to create enough energy to get you not just through your basal metabolic rate throughout the day but even some fairly rigorous activities. The more time you work at this the better you become, the more metabolically-efficient you become, it's a cool thing. And it's just a tool, it's just a strategy that I'm offering people.

A lot of people choose to stay keto for a long period of time because they love it so much and that they're into that whole space, I even am trying to kind of redefine the word keto because I don't like ketogenesis, I don't like ketosis. In my

mind ketosis almost indicates that you're doing it wrong because you're measuring such high levels of ketones that you're wasting them, and I want to be a metabolically-efficient human being. So I like the term keto that says I'm in that space right now where I can wander in and out, I'm literally on the fringe so that some days if I'm in keto, in other words, I've severely restricted carbs, there's zero noticeable effect other than I still feel great, or some days when I wander into that carb space where I'm getting 120 or 170 grams of carb, again, zero noticeable effect. I'm in that beautiful zone where I built a metabolic machinery to be able to do whatever I need to do in whatever food context I'm encountering, whether I'm in the presence of a lot of carbs or whether I've decided to go two meals and not eat, there's no transition anymore because I did all the work. Does that make sense?

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Robb: Absolutely, yeah. And it's interesting because we want to be scientific and quantifiable about things as possible and so you could get super wrapped around the axle of blood glucose monitoring and ketone monitoring and whatnot. But it's interesting in that really what matters in this is your subjective experience and to your point, like the midterm quiz or self-check, like how do you feel first thing in the morning. Whereas if you can go all the way to doing a high-intensity fasted workout and you feel fine waiting until eating at lunch, that's probably a good sign that we have stress in check, our sleep is good and we're fueling ourselves appropriately so that we feel good and we're quite resilient. And I think we could track a zillion different markers and it wouldn't really inform the process any better than just like, hey, man, how long can you go without eating in the AM or any given period of time and what type of work output can you do comfortably doing that and that's probably a better indicator than any other metric that we could track.

Mark: Right, with the caveat that you feel good, you have all the energy you want, you never get sick, and most importantly, you don't feel hunger, because this whole hunger thing has intrigued me for a long time. What's his name, our buddy up north who talks about hunger a lot?

Robb: Stephan Guyenet.

Mark: Yeah, from his initial exploration into that to just, again, the subjectivity of hunger and appetite and cravings, and probably the greatest benefit of keto of all is this diminution of hunger, appetite, and cravings. And again, so many people are in this sugar-burning paradigm, who are in the carb-dependent paradigm live their lives basically from one meal to the next. Like got to have breakfast because that's the most important meal of the day, and then got to have a pre-workout meal because I don't want to cannibalize muscle tissue, and

then lunch is always noon, that's when I take my break, so what's for lunch, and then after lunch it's like I think I can probably make it till 6:30 to dinner but if I can't I'll have a bagel in the break room, or I'll stop and have a sugary caffeine drink or whatever.

People live their lives from one meal to the next and this hunger and this appetite and this craving continues to dictate so much of their thought process that it gets in the way of everything, it gets in the way of productivity, it gets in the way of having just enough energy to move efficiently throughout the day, it might even get in the way of relationships, who knows. When you can't get rid of that as a force in your life and just say, my hunger mechanism is so finely tuned and I'm so good at burning fat and I'm so good at creating ketones from some of that fat that I don't need to eat and oh, my God, it's 4:00 and I haven't eaten yet today.

One of my favorite lines and I've repeated it a fair amount, but you know Todd White from Dry Farm Wines, Todd's been keto for a long time, five or six years, and he loves it, he stays there. He's a very fit guy, he's got more energy than just about anybody I know, he travels a lot, he runs a company. He eats one meal a day and it's dinner, maintains all of his muscle mass, does all these stuff, so that's really, really quite interesting. I've met a lot more one-meal-a-day people since I met Todd but the conversation I had initially with Todd was, "Oh, geez, one meal a day?" he says, "Yeah, but I've got to be mindful of what I eat at dinner." And I'm thinking to myself, yeah, you've got to be mindful that you don't overeat and gorge yourself, right? He goes, "No, I got to be mindful that I eat enough because I'm just having one meal a day."

That's such a cool kind of space to be in, to look at mindful eating from a completely different perspective of I got to be willing to push the plate away, versus, I got to be willing I have enough on the plate that it gets me from one day to the next. So this freedom from hunger and appetite and cravings is pretty amazing. I know you know a lot of people, I say most people whose basic thought process around food is what's the most amount of food I can eat and not gain weight. A lot of people kind of have that, it's like how much of this dessert can I eat and not gain weight, how much of this plate that I was just offered up can I eat and not gain weight, and that's just such a bizarre way of looking at life. It has nothing to do with satiety, it has nothing to do with energy efficiency, it has nothing to do with maintaining muscle mass or anything like that.

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And, by the way, wired to eat, that's the brain that thinks about, the frontal lobe enters the picture and says, well, I'm wired to eat as much of this shit as I can, the frontal lobe has to come in and go, okay, got to put a little bit of a governor

on that, what's the most I can eat and not gain weight. So we're literally kind of fighting our biology because we're presented with so much freaking food and we're constantly having to put a self-check and a governor on ourselves. We can't recreate the ancestral past, but we can recreate an ancestral eating pattern by just not eating three meals a day. It's an interesting mind game to play with yourself and instead of saying what's the most amount of food I can eat and not gain weight, to take the converse of that and say what's the least amount of food I can eat, maintain muscle mass or build muscle mass, have all the energy I need for everything I want to do, never get sick, and most importantly, not be hungry.

Robb: Right. It's making me think of Bill Lagakos over at Calories Proper, he's a brilliant guy and he unpacked a couple of different related studies. They had some folks in a mild hypo-caloric diet, so they got their basal metabolic rate and calculated their body fat percentages, it was pretty nicely done. So everybody was eating at what would be a hypo-caloric level, everybody lost a little bit of weight, it was about the same amount of weight but they had people either eating two meals a day or six meals a day. The six-meals-a-day folks lost weight but they had higher insulin, they had higher inflammatory markers, they had a higher coagulation potential in their blood, versus the two-meals-a-day folks. And so it's fascinating, they were effectively eating the same amounts of food but one group of folks had significant periods of time without eating, the other folks didn't have those significant period of time and they were less metabolically healthy, they had more inflammation, more blood sugar dysregulation despite the fact that they were still losing weight. So that was kind of a fascinating breakdown that Bill did.

Mark: Absolutely. And other question I might ask them is, who woke up hungrier. Because again, hunger sort of takes the wheels off of everything, it kind of derails efforts in every eating strategy. So if you can find a way to curtail hunger and take that part of the discipline out of the equation it makes any eating strategy that much easier to embrace.

So that gets us back to this keto reset diet and sort of the keto way of life which is to gradually reduce carbs to get to the point where you've forced the body to make a decision, are we going to expect more glucose from our carbohydrates, particularly the brain, or are we going to just settle in and start building the metabolic machinery to not only take fats out of storage and make ketones but be able to burn them efficiently and at a high enough rate that we don't really need glucose anymore. And this takes about three weeks. So it's interesting that you could be in ketosis tomorrow morning if you just don't eat, everybody could be in ketosis but that doesn't mean that it's benefiting you. In fact, most people who are carbcentric and skip two meals go into ketosis pretty quickly and then you can smell it in their breath, you can detect it in all sorts of ketone monitors, et cetera, et cetera.

But it's not doing them any good because they never spent time there so they haven't built the metabolic machinery to access those ketones and burn them efficiently so the brain is still kind of going, "Oh, my God, where's my glucose? Holy crap, we got to secrete some cortisol here, we got to get on the ball and start tearing down muscle tissue to make some glucose out of amino acids." It's this destructive catabolic process because you haven't done the work. But if you ease in to it, if you slowly restrict carbs and get down to the point where you've upregulated mitochondria biogenesis, that the mitochondria that you do have, which have their own DNA and respond to signals and become more efficient, now you've built these metabolic machinery. And by the way, the metabolic machinery doesn't go away if you get out of ketosis. As long as you're reasonably thoughtful about your carb intake that metabolic machinery stays there, you just have more mitochondria, they work better. You can take fat out of storage pretty easily and then the body doesn't even know if you got the 500 calories that got you from 8:00 AM to 4:00 PM, it doesn't know if you got it from a plate of bacon or from your ass or your butt or your belly. That's one of the beautiful things about keto.

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So it's quite interesting, not just the biochemistry of what happens when you build this metabolic machinery but the biochemistry of the hormones that accompany your intake of food and the fact that you're not in this, the brain is not prompting the adrenals to secrete cortisol to address an emergency situation anymore. Because that was one of the things I had an issue with, sometimes they would talk about well people go into keto quickly, they produce high amounts of cortisol. Well, duh, if the brain hasn't gotten used to burning ketones and thinks that it's going to need glucose to survive there are going to be some short-term adaptations.

Robb: So Mark, maybe that's kind of a good segue. If we were to take the population at large and maybe stick them into three, five, six different buckets, could you characterize some folks? And I know, again, we're trying to take population averages and apply it to individuals in some way, but do you have like a broad brushstroke recommendation of these types of folks are probably going to be incredibly well-suited for a ketogenic approach, these folks might be a coin toss, and then here are some people over here that it might be dodgy to even play in the ketogenic pool?

Mark: Well, I haven't given that the kind of thought that maybe you have, I'd be interested to hear what you have to say because again, I think it comes down more to history. So you could say, somebody who's overweight but not yet diabetic would be a good responder, somebody who's already low-carb and only needs to make a few little transitions and changes to their diet would be a great

responder, a lot of women who are maybe post-menopausal would not be good responders without some attention to detail, it's like those women have a whole different set of hormones.

Robb: Who would have thought that, it's like they're different or something, yeah.

Mark: So on the one hand, we have a lot of women who have only gotten success on keto, having tried everything else in their domain. And then we hear from other women who said, I tried keto, it just didn't work for me. I don't know if I did it wrong or whatever. And of course, I don't like to tell people that they did something wrong if they tried it, but if the basic biology is the same and now we're just fiddling with the knobs a little bit, maybe there is a right way to go about it. As we say in the book there are lots of wrong ways to do keto and there are lots of right ways to do keto. I don't want it to be so dogmatic that's like "This is the way," but among the lots of right ways maybe that's what has to adapt to the individual.

Robb: Right, it definitely seems like electrolytes are a big deal. And then circling back to your point about satiety, if we look at this from a biology perspective, we could maybe make the argument that for women they're more responsive with regards to caloric and nutrient adequacy or deficiency, particularly if they're into childbearing years. If they're not getting enough calories, enough nutrition, biology is like okay, you're not a candidate for reproduction right now and that just from a very mechanistic standpoint makes sense. The ketogenic diet is arguably one of, if not the most, effective means of mitigating that appetite and so is there the potential for folks to under-eat? I would say yes, to the point talking about Todd from Dry Farm Wine, like you sometimes need to actually be kind of fastidious about okay, did I eat enough for the day? So maybe we've got a combination of possibly some lower insulin levels which may mean a little bit of a decrease in thyroid output, not necessarily pathological, but maybe trending in a direction, and then if we've got low calories on top of that, because you're just not hungry, then yeah, it seems reasonable that someone can get in the deep end of the pool that way.

Mark: Yeah. And again, then we would go back and say what are the fuel stores that the person is carrying with them, because we know that there are people who have gone a year without eating under medically-supervised condition but lived on their fat stores, not eating but certainly consuming some broth or some kind of electrolyte supplement. Yeah.

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So women of childbearing age, I'd say that's something you want to be aware of as you embark on your keto journey. But athletes, one of my pet peeves among elite athletes is the unwillingness to try this because they're not willing to give up -- I guess I understand it -- but you're not willing to give up two or three months of adaptation which takes you out of competition in order to do this on the off-chance that you're going to be a better fat-burner, I'm going to say in all likelihood, but they're going to say, what happens if it doesn't work then I've lost my season. But we know now enough about some of the top endurance athletes who are experiencing credible breakthroughs in performance deriving 92% of all caloric requirements during heavy competition from fat. And that was almost unheard of even a decade ago. Phinney and Volek's FASTER study which showed that there are people deriving 850 calories an hour from store body fat in a race.

Robb: Which was like double what the textbook had said it is the upper limit.

Mark: Exactly. And that's just from people who have been keto for a little bit and were willing to play around with it, that didn't even take into account sort of the genetically gifted keto superstars who are going to arise. I think the next level of marathon, triathlon, certainly in ultrarunning will show huge improvements in performance from a ketogenic training strategy which certainly includes other modalities, the type of aerobic activity and what heart rates you're training at, the amount of work you do in the gym developing power and sustain power over time. So there are a lot of factors that come into this but it also opens the door to some amazing breakthroughs in supplementation during the race, to be able to supplement with ketones or MCT oil and a little bit of glucose but not real glucose but slow-burning super starch, that's where these real breakthroughs are going to be where people are manipulating all those variables and able to increase their output tremendously for the same heart rate and all other variables being the same, I think we're going to see some major improvements in times there.

Robb: Yeah. And it's interesting because when we look at the characteristics of caloric restriction, fasting and improved longevity, it's not a perfect overlap when you look at "nutritional" ketosis with again, to your point, the quotation marks around that because that can mean a lot of different things to different people. But just generally being more fatcentric, pumping energy through the mitochondrial complex relegated to beta fatty acid oxidation whatnot versus the more glycolysis-driven glucose shunt we tend to get less reactive oxygen species, we have a globally-reduced inflammatory response.

Dr. Phinney of Low Carb USA, he shared a slide which is in a to be released study and they put some mice on a variety of different diets, one of them was what he called a Paleo mouse diet which was kind of higher protein and lower carb, then they had a ketogenic mouse line and then kind of a standard mouse line. The

Paleo mouse line lived about 10% longer than the standard mouse line, the keto mouse line lived 20% longer than the standard mouse line, and it still is unclear if we can anticipate as good a transfer to humans as what we see in mice. We have different genetic considerations of offspring, it's called genetic reaction norms and whatnot, but it's super interesting. And even if the minimum is that something like this improved health span, that's a pretty remarkable win.

Mark: That's huge. It's huge and again, it also comes back to a critical component which is if hunger and appetite and cravings are diminished then this becomes a very sustainable way to operate, keto. And in my view of the world, keto means being on the fringe, in and out, effortlessly. But whether I'm in or out I still eat 30% fewer calories today than I used to so that calls up the question of how many calories does it really take to live, what's the appropriate number of calories for a person because we used to assume, like I used to assume I needed like 2700 calories a day. I have many days during the week when I might get 1700, 1800. I feel great, I have all my muscle mass, so what's different?

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One of the things that's different is I'm so much more energy-efficient. I'm extracting calories from my fat stores or from my food, I'm using the ketones, I don't need glucose anymore, I'm sort of unburdening myself from having to take in carbohydrates at all, and so I'm becoming metabolically-efficient. And back to how people, particularly in the US, have looked at the body over the past few decades, one of those mantras that conventional wisdom and particularly the fitness community has always brought up is you want to be metabolically-inefficient. It goes back to the how much can I eat, it's also how many calories, I want to be a calorie-burning machine.

You go to the gym and you see the people on the treadmill and it's like oh, you're running 40 minutes, are you training for a race? It's like why do you train so much and the answer is because I love to eat. Are you kidding me? You're struggling and suffering for 45 minutes five days a week because you want to eat a couple more bites of something you shouldn't probably eat in the first place. How insane is that? And yet people think in terms of metabolic inefficiency, they think in terms of I want to be so inefficient that I can eat a lot of food and burn through it all and not gain weight. Well, that might be one way to look good naked, I suppose, but if you look at metabolism across all species, mammals in particular, those with the slowest metabolism live the longest, those with the speedy metabolisms don't live that long. Now we could talk about thyroid and people say I've been doing this diet and my T3 is a little low, but I feel good, my hair is great, my nails are great, I'm not cold, I sleep well. And I'm like okay, your T3 is a little low, what did your doctor say? Well, he's thinking about putting me on some hormones.

If you're within range and you're low within range and you feel great, once again, you win the contest. Your engine is idling at the perfect low speed, you're probably going to live longer than somebody whose engine is revving at a very high rate, whose burning up a lot of calories all the time, who's on fire all the time, whose got night sweats because of the thermogenic effect of food and all these other stuff that we used to talk about. Even Michael Eades, who's a good friend of ours, used to talk about it's called the metabolic advantage. But I think the metabolic advantage the mindset there is how can I waste calories, how can I pee out 70 calories worth of ketones, how can I do the uncoupling protein bit in the brown fat and burn more energy? And so it's termed the metabolic advantage because somehow it allows you to burn more calories.

Well, what if the metabolic advantage was once again, how can I be as efficient as possible, burn fewer calories, maintain muscle mass, build muscle mass, have all the energy I want all day, never get sick, and most importantly, not be hungry? It's like taking a Ferriss term, the minimum effective dose of food. What's the minimum effective dose of food? And that's so interesting to me now to discover for myself that I can thrive on 30% fewer calories than I did five years ago.

Robb: People like Art De Vany even to Greg Glassman, the founder of CrossFit, ages ago he talked about noticing that if he could goose his athletes, he really liked the Zone Diet but it was this much higher fat approach when people got leaned out, you were about 65% to 70% fat, maybe about 17% to 20% protein, and the remainder carbohydrate, mainly low glycemic load carbohydrates. And he just noticed that over the course of time the folks that he worked with, they just seemed to require fewer calories overall, and he caught so much flak about it, it was pseudoscience and boogeyman stuff. And then in talking to the folks over at Ketogains and some of the research like Ryan Lowery and some of these other folks are doing seem to be a real story behind that anecdote.

[0:44:59]

Mark: Yeah. And Luis is a great guy over at Ketogains and he's been the n=1 for ten years, I guess, and he's been very generous with his information. I think we're entering a new era where there's going to be a lot of reevaluation of what we assumed to be true about energy requirements of humans, and that plays back into the discussion about longevity and the keto mice living 20% longer than the low-carb mice. By the way, just two days ago, a study came out, sort of a longitudinal study that looked at carbohydrate intake versus fat intake, and basically suggested that the people who ate more carbs had higher all-cause mortality than the people who ate higher fat. It was really an interesting, sort of an I told you so for the Paleo community, but just an interesting outcome that

you'd think people who ate more fat would not live as long but it was the people who ate more carbs that did not live as long. And that goes back to what Ron Rosedale used to say from day 1 and which I've adapted as one of the things I tell people which is the less glucose you burn in a lifetime, probably the better off you care.

Robb: Right, unless you pulled the genetic lottery card, then yes.

Mark: True. So back to the genetic lottery card, some people can get away with a lot of carbs, a lot of glucose, fine, that's great. By the way, if you look good doing that, because I did, I had 700 grams of carbs a day for ten years when I was training, I weighed 30 pounds less than I do now. I looked great, my wife said I looked skinny, she almost didn't marry me because I was too skinny, but I could get away with it. Now, getting away with it on the outside doesn't mean you're getting away with it on the inside and that is a crap load literally of throughput for the body, and I think it's not without some long term metabolic cost.

Robb: Absolutely, I'm nodding vigorous agreement although that doesn't carry over so well on audio-only podcast.

Mark: Yeah, yeah, yeah. And so we talked a little bit about nutritional ketosis versus starvation ketosis and I'm trying to find that fine line in between because I think there's got to be a new word between those two because nutritional ketosis which is what we're talking about here but it gets abused by a lot of the community and there are some leaders in the community who will go unnamed who still have a hundred pounds to lose, or 150, bragging about I put fat on my steak and I'm always in nutritional ketosis and it's all about the blood work and the numbers. And at some point you want to reduce that excess stored body fat and in order to do that you have to burn more calories than you store. And you may enter a point in nutritional ketosis where you can take in 4500 calories a day and not gain added fat because you're--

Robb: You're super inefficient with it. That was my story for a couple of years and again, a hat tip to Luis and the other folks at Ketogains. I had never really connected the dots and that was something that for a long time it made me think I don't know, maybe this insulin hypothesis is accurate because man, I could upend bottles of olive oil, eat tons of food, like I was eating 5,000 to 6,000 calories a day and was at single digit body fat levels, effortlessly.

Mark: The difference is you wouldn't be able to drop weight from there. The good news is you don't store any more fat and the quasi maybe not so good news is that your body figures out ways to ramp up, that's the metabolic advantage part, by the way, to ramp up uncoupling proteins, brown fat and thermogenic effect of food and all the ways in which your body finds to generate heat to dispose of

those extra calories because you can't utilize insulin to shove it into the fat cells. But that doesn't mean that that's healthy, it just means that you are getting away with eating a lot of calories and not gaining weight. Again, it's back to what's the most amount of food I can eat and not gain weight. Well, what good is that, that's like some parlor trick. And what I'm seeing now in a lot of the keto community is this tendency to brag about well, I could just eat all I want and I never gain any more weight, and the fact that I don't lose weight doesn't mean I'm not healthy. Okay, I'm going to take an issue with that, I'm going to have a problem with that, because in order to burn off body fat you do have to burn more fat than you store and that's the beauty of keto is that it manipulates these hormones in a way that extracts energy from your stored body fat, doesn't rely on external sources of food every three hours to keep your mental acuity or to keep your energy levels up.

[0:50:19]

Robb: Mark, going back to that sliding scale of carbohydrate which for me is still genius with how you did that in the first book, it's been interesting for me. So doing Brazilian jujitsu I've really tried to keto fuel at that like 30 grams a day of effective carbohydrate and I can go a day or two with that doing jujitsu but it's like day three, day four, day five I start just kind of blowing out. And so I've tinkered with that, even at five to six-day-a-week training volume, two hours a day of training on some of those days, about 100 grams to 120 grams is about the most that I need and I am right as rain with that. My recovery is good, I'm typically eating two meals a day, usually a breakfast and a dinner, interestingly. I've been playing around with a little bit of that circadian entrainment and so doing an earlier meal and then no lunch, occasionally if I'm super hungry after a training session I'll have a little snack but that's been working great for me. And again, it's right in that strike zone of what you had in your very first book.

Mark: It's crazy because I sort of made this comment that really nobody but a world-class glycolytic athlete needs more than 150 grams of carbs a day and you're sort of giving me a testimony to that effect. Now, I would even say to you, dude, two hours a day, five days a week, that's too much training. Now if you love it and you're having fun doing it that's cool, now we're talking about you and what gives you pleasure in life and part of that is the training. I would say, because I wrote a whole book last year called Primal Endurance which is how do you train for these events in the most efficient manner possible, which then doesn't suggest that you need to refill glycogen stores every day. Look, if you took a day off and you didn't eat 125 grams of carbs, your muscle glycogen would still build itself back up, even if you're fully keto you would still restore glycogen. But it wouldn't happen in a 24-hour period, it would happen in a 48-hour period, so it's not like you stopped refilling glycogen. So like if I said you were going to just go straight keto and keep doing your Brazilian jujitsu, one of the things I'd say is

maybe train every other day hard and then in between do easy days, and then I might say that's the time to take some ketone supplements. So you take a ketone supplement half-an-hour before your BJJ event, that gives you enough time to hit the bathroom, you know what I'm talking about.

Robb: If need be, yes.

Mark: Because some of them are pretty tough on the stomach. But I use ketone supplements, and I'm not the biggest fan of them, but I use them before like a heavy leg day or I use them before an ultimate Frisbee day where I'm going be sprinting with 20-somethings for two hours in the hot sun, and I find that it works because I did the work and because I built the metabolic machinery, the ketones just give me one more level, one more hedge and because back to the term metabolic flexibility.

If you can, in your workout, burn fats and glycogen and ketones then you're spreading the effort around with these substrates and that's the beauty of metabolic flexibility is the ability to have your muscles go we're really good at burning fat and if we have to go glycolytic we've got enough glycogen stored and if we're out of glycogen we've got some ketones. It's so cool how the body adapts to this and it's so frustrating and bizarre that we're only now, after 60 years of exercise science, we're only now starting to even realize the potential here.

Robb: Right, Hey, Mark, where are you at on the electrolyte story, like how aggressively do you address that, what are your thoughts around all that?

Mark: I certainly salt my food whenever I get the chance so I get basic sodium. I take 400 mg of magnesium, couple of hundred of potassium, I take some zinc just about every day. I pay attention to my electrolytes and if I don't I get that classic thing where I wake up in the middle of the night and now I get weird cramps if I don't do that, from being keto. I get a cramp like I forget what the muscle is on the outside of my shin, so when that pulls the whole foot starts to supinate, it's like geez, that's crazy, I never had that happen before and how do you stretch it.

[0:55:10]

So yeah, I pay attention to electrolytes, I think that it's important and I keep bouillon around, I know that Phinney does that a lot. You just keep bouillon cubes and put one in hot water and sip that a couple of times a day, it's almost like a nice little drink. Got a funny story to tell you. My wife got this big jar of pickles the other day and it's Bobby's Pickles, and they're like three-and-a-half inches long, they're good-sized pickles. And you look at the nutrition facts panel and it blows my mind, it's like zero calories, zero grams of fat, zero grams of

protein, zero grams of carbohydrate, 160 grams of sodium. So they're like the perfect snacking food for somebody who's trying to burn off more energy than they store because they're not providing any calories but they are providing sodium, they've got a crunchy salty taste to them, and they're providing a substrate for your gut biome. So I was intrigued by that. I've been sort of coaching people on what do I have for a snack when I'm hungry and I think well you have some artisanic coconut butter or a handful of macadamia nuts or some beef jerky or something like that, now I've got a new one to add.

Robb: And it's funny, Luis Villasenor from Ketogains, we spent some time together down in Mexico. My family and his family all got together and when we went shopping he came back with like a flat of pickles, and I'm like, really, pickles. And the same deal, like looked at the nutritional content and he's like yeah, they're the perfect keto food, the sodium content and everything.

I have to say I just had James DiNicolantonio on the show, he's the author of The Salt Fix, and between that and what the Ketogains guys have talked about, Phinney and Volek, I've really been aggressively supplementing my sodium, a little bit of magnesium intake as well prior to training sessions, and it's just been night and day difference, like shocking difference. I take about a half-a-teaspoon of table salt which ends up being about 800 mg of sodium and then I do about 100 mg of Mag Citrate or Mag Glycinate, the citrate can definitely give me the trot so I have to be pretty careful with that, but I take that in about eight ounces of water about 20 to 30 minutes before training session and then I just sip on regular water through the training session and it's been amazing, absolutely a game changer.

Mark: Yeah. It's interesting to see what a little shift in your routine, a little addition to the equation, what a big effect that can have. Point being that you could be doing everything else right and still not quite have it dialed in.

Robb: Right, and that electrolyte seems to be where folks can fall down frequently in this. Like the sleep disturbances, as people start diuresing, they lose water weight in the initial stages of keto or low-carb because their insulin levels are low, aldosterone drops, we don't hang on to sodium. But then that can actually ping the body to upregulate aldosterone release and it tends to do it in the evening and that ends up being kind of an adrenal stimulating effect. And so I suspect that a lot of the people who have sleep issues in and around keto that they're not getting enough electrolytes, specifically sodium, so that they can kind of quiet down that aldosterone release.

Mark: Exactly.

Robb: Mark, what else do you have going on here? I want to be respectful of your time, I could chat with you all day. Oh, and this podcast should be doing up October 3rd, if I'm not mistaken, that is the release date.

Mark: Preferably go to your bookstore to buy it because here's the thing, all my friends in the keto world, in the low-carb world, Robb Wolf, Melissa Hartwig, they're all New York Times Bestsellers. I sold a pantload of The Primal Blueprint but never made that list so that's what I want to do with this book. I want to be a New York Times bestselling author so if you're going to buy the book you could certainly go online, buy it on Amazon, Books-A-Million, Barnes & Noble, but yeah, release is on October 3rd so this is a big week for us.

Robb: And just to let folks know a little bit of how the sausage is made, it's kind of a whacky deal but a book purchased in a brick and mortar setting counts for like 1.5 sales at the New York Times, in theory, they change this algorithm all the time. But an online purchase may count as 1/5 to as little as 1/10 of a purchase. So like you could just sell the pants off of the book online and never make the New York Times Bestseller List and somebody else sells a comparatively small number of books but they're mainly in brick and mortar setting and then they make the list. It's a really whackily curated kind of gig but let's get out there and get the Sisson a New York Times Bestseller because we got to tick that box here so yeah.

[1:00:23]

Mark: Exactly, this is a bucket list item. And then we have a website, it's ketoreset.com so if you do want to order from there there are links to everybody who's selling online. But if you got a local bookstore go down and get that. It's at fine bookstores everywhere. And yeah, appreciate it, it was a tremendous learning process for me to assume that I knew everything there was about ketosis and then to write the book and go wow, this is amazing. But so many people are doing it wrong and keto is like the most searched term of all diet terms on the internet this year and there's so much bad information I want to set things straight. So it's a kinder, gentler way of using keto as a strategy to improve your metabolic flexibility and burn fat forever.

Robb: Awesome. Oh, hey, I just need to do a quick shout out to Primal Endurance which is, in my opinion, one of the best overall strengthening conditioning books out there in general even though it's specific to endurance athletes. That has probably helped my jujitsu game more than just about anything else that I've done and I still primarily rely on that weightlifting protocol that you have detailed in that book. And I always blank on the acronym for it, the--

Mark: Maximum sustained power, MSP?

Robb: Yeah. That is so time-efficient. It's the best return on investment for strength work that I've ever found so I have to give you a huge hat tip for that.

Mark: I appreciate that, that's my good friend, Jack Devore, who developed that and it's his protocol that we use for a long time with athletes. I was doing the diet part and then he was doing the weightlifting part and we got tremendous results on that. But that's Jack's thing and it really is, it's a whole new spin on... Again, so many people in this exercise physiology world are caught in the '50s and '60s in terms of the science they're using and he just sort of opened the door and said if it's about doing work and sustaining power there's a better way to do it. So I appreciate the fact that you're using that and love to hear the fact that you're getting benefit from that.

Robb: Yeah, huge benefit. I still get my fanny handed to me a lot on the mat but it's never due to strength and it's never due to cardio, and I really have to thank you for big chunks of that. Awesome, Mark.

Mark: Thank you.

Robb: Well, thank you. I can't wait to see you in real life here. Are you going to be making any appearances any time soon?

Mark: It's funny, I'll be in South Bend, Indiana for our grand opening but that will probably be before this airs. And then I don't know what I have coming up, I'm doing Mark Divine's Unbeatable Mind thing. Yeah, I got some appearances but I'm trying to travel less now, not more, with so much going on.

Robb: Shocker. Awesome, Mark! Thank you again, really looking forward to seeing you in real life, very much looking forward to seeing The Keto Reset Diet as a New York Times Bestseller very, very soon.

Mark: Appreciate that, man.

Robb: All right, man, take care. Bye.

[1:03:24] End of Audio