Paleo Solution - 273

[0:00:00]
[Music playing]

Robb Wolf: Hi guys. Thank you for your continued support of the PaleoSolution podcast. I also wanted to take a moment and thank two of our wonderful podcast sponsors. The first is Thrive Market. Thrive is a new online marketplace offering the world's bestselling natural and organic products at wholesale prices. If Costco and Wholefoods online got together at a rave and got liquored up, their child would look a lot like Thrive Market.

So the way that Thrive works, for less than $5 a month, about $59.95 annually, you get a membership that gives you access to more than 2500 of the highest quality food, supplement, home, personal care and beauty products. Those are all delivered straight to your door and at 25 to 50% below retail price. Orders above $49 are free but that's only in the continental United States. RobbWolf.com followers get a free two-month Thrive Market membership as well as 20% off of your first order. So go to ThriveMarket.com/RobbWolf and you can get in on that deal.

Our second podcast sponsor is Hilete. Check out Hilete's innovative athletic apparel at Hilete.com. You'll love HIlete and I absolutely do. You can love a whole lot more of them because if you enter the code Robb Wolf 50, R-O-B-B-W-O-L-F-5-0 you'll receive a holy cats worthy 50% off your purchase. Thank you again and it's time for the show.

Hey there! Robb Wolf--Sorry, I'm waiting for a memory upgrade on my iMac as things tend to start slow. Another edition of the PaleoSolution podcast. I am very excited to have Professor Tim Noakes with us here today. Professor Noakes is the author of quite a long assortment of books.

Professor Noakes, how are you doing?

Tim Noakes: Very well. Thanks, Robb. I'm just loving the lifestyle that saved me because I think like many who converted to this lifestyle we were in trouble and I needed help and changing to this lifestyle made a massive difference to my health.

Robb Wolf: Well you know it's such a fascinating story and I think it parallels mine in a pretty remarkable way. I had spent all of my life up to the age of about 27 or 28 feeling like my head was stuffed with cotton and it felt like the

world was happening out there somewhere and had never really connected the dots on things. I had always been very interested in human performance and nutrition. I had two very well meaning but quite ill parents both of them with type 2 diabetes, both with autoimmune diseases, both of them smokers. I had a sneaky suspicion that better nutrition might have improved their situation.

I graduated from high school in 1990 and so in the United States, the food guide pyramid emerged I believe right around 1986 so there was this real push or shift away from a balanced kind of four food groups model to a very grain centric model. Assuming that whatever we were doing was wrong and we needed to shift gears, I started eating much more carbs, lower fat, lower protein and I've got to say the wheels absolutely fell off the wagon for me. I ended up with ulcerative colitis, blood sugar swings that were really I would say catastrophic like when I would head into a hypoglycemic event, it was almost terrifying for me. Now I know that you came from much more of that conventional wisdom, high carb, low fat kind of background. What was your process in heading towards higher fat, more moderate carbohydrate intake particularly with your background in elite level athletics?

Tim Noakes: Indeed, Robb. I was born in Harare, Zimbabwe, Rhodesia and so it was still a frontier town in those days and my parents raised me I think on a paleo diet because we then came to South Africa and again it was long before there was the industrial processed foods and I used to eggs and bacon and liver and brains for breakfast plus a whole bunch of other stuff which is very paleo. I did that until I went to medical school and then became clever and learned that diet that I was eating was going to kill me thanks to Ancel Keys' theory. So we changed and I then went on to the grain diet. Now my father developed type 2 diabetes and I never thought that I would also be at risk because I was always lean-ish. I was very lean about 90-96 so I thought I'd put on a weight but it still didn’t strike me you know actually I might be diabetic.

[0:05:20]

It was only when I read the book, *The New Atkins for the New You* by Westman and Volek and Phinney that I suddenly realized that there was a whole bunch of evidence that I've been completely missing and within two hours of reading that book, I decided that's it I'm never going to have another carbohydrate. Now I know that I was frankly diabetic then and so immediately you could image how beneficial it was for me and my running just improved dramatically. It went back 20 years to where I was running when I was running when I was 40 years old. I started the diet at 60 and went back to running as I was at 40 and it was just amazing. I

couldn’t believe because I thought that I was just old and tired and didn’t realize that it was all nutritional cause that was making me feel so lethargic and so on. So that was my story and I didn’t actually announced to South Africa that I changed because I knew it would be catastrophic for my career.

Robb Wolf: Right.

Tim Noakes: That I would've checked such criticism and I also didn’t know enough at that time. Certainly, I was absolutely ignorant of all this incredible information on low carbs which of course you and many others have helped expose but I didn’t know about it. Today five years or four and a half, five years down the line and 400 books later and thousands of articles later, I now know that what I did was right and I understand why it was right.

Robb Wolf: You're a legitimate in a university. I'm just a peddler of pseudoscience so there's a different vector on that process.

Tim Noakes: Well not really because my own university disowned me. In October last year, they sent a letter to the local newspaper saying that they dissociated themselves from me and the diet that I propose. They say it's dangerous and it must not be adapted by anyone. That’s my own faculty that I've served religiously for 41 years.

Robb Wolf: Wow.

Tim Noakes: You know that's never ever happened in the history of my university and it really was quite interesting because it shows that the guys didn’t have the decency to discuss it up front and say okay we have a difference of opinion, let's debate it. They went to the media and demonize me in a way that was in fact they defame me but that beside the point. But it wasn’t discussed as an academic debate and in fact in 10 days time next week, 10 days time, I have to appear before the Health Professional Council of South Africa. That's the organization with whom I am registered and they oversee that I act ethically. I have a conduct investigation into my conduct on Twitter, never happened in the history of South Africa before. There is no precedent for it but I was reported by a dietician for a disgraceful conduct when they looked at it and giving advice that would be killing people.

When they looked at it, they realized they couldn’t actually make that claim so then it's being downgraded that I gave unconventional advice on Twitter. That’s the extent of the animosity that’s happening to me over

the last four years and I didn't conceive that it could be this bad but in fact we really welcome this investigation because we are so well prepared, we know all the evidence on our side. So as long we get a reasonably fair hearing, we should be alright.

Robb Wolf: Clearly I have a very biased opinion on this and I'm in the same camp that you are but it's fascinating to me that if we were to give that established academic scene, the benefit of a doubt, it most we could boil this down to they are proposing that there is a singular nutritional approach that is most efficacious for all of humanity.

Tim Noakes: Precisely, yeah.

Robb Wolf: It seems to deviate quite a bit from what we understand to be fairly consistent with the anthropological record and that's really--that's giving them about as much benefit out of this story as we possibly could. It could be a very ironic process of them sticking their necks in a rather tight noose when the floor drops out of this but I really applaud your tenacity and willingness to take heat for this. Now correct me if I'm wrong but some of your process was--you wrote a fantastic book called *Waterlogged.* Talk a little bit about that book because it's absolutely fantastic and then also was that part of your process of kind of reanalyzing this very carb-centric approach to athletic performance?

[0:10:39]

Tim Noakes: That's a great question because although *Waterlogged* was involved, it actually did not inspire me to investigate the carbohydrate side of drinking during exercise. *Waterlogged* is purely about the water content and that you could over drink and I then recognize that particular industry in the United States or America had over sold the signs of fluid replacement during exercise and I realized how they did it and they brought out the scientist and to some extent, they controlled the academic process by making sure that they had people who were subservient or was serving their interest editing most of the journals.

A lot of people get very angry when I say it but we have actually shown that. So that they distorted the peer review process so when we try to publish a paper which showed the opposite to what the guidelines were, we couldn't get it published and I realized at that time that the only thing that would allow us to survive was we have to do the best science. But we have to find journals which were independent of the sports drink industry and there were two and we published our work in those two journals and ultimately, we're able to obtain everything because we were able to show that the guidelines were commercially driven and were not scientifically based. So that thought me how industry works and it has

been a very good lesson because I see its actions in what we're talking about now that industry is driving the theory that obesity is your choice and if you can choose not to drink Coca Cola and other things like that and be lean as long as you exercise and of course we know that's not the case.

So what happened was it took me 30 years to disprove the theory that you must drink as much as tolerable during exercise. That was the guideline. The night I did it and sent of the manuscript to the publishers and incidentally the tile of the book as I wrote it was the search for the killers of Cynthia Lucero and she was a young lady who died in the Boston Marathon in very public circumstances. We could prove that she had followed the guidelines that she was told absolutely to the T. She had drunk 40 ounces of fluid every hour for five and a half hours during the Boston Marathon, which was run at 10 degrees centigrade or 50 degrees Fahrenheit with the cold wind and no sun. I mean that's when you get cold stroke.

Robb Wolf: Right, right.

Tim Noakes: You don't get heat stroke. But because she had been brainwashed that's what she had done. Anyway, the night I sent it of was my brain said to me--obviously I hadn't been running much and my brain said to me is get up tomorrow morning and you must run and you mustn't stop running for the rest of your life. I got up at 6 o'clock in the morning. I had the most terrible run I've ever had. I thought I was going to die when I climbed right up this tiny little hill and when I came home, I went to my emails and there was an advert for *The New Atkins for the New You* and what really struck me was it said you can lose 6 kilograms in six weeks without huger which I knew was rubbish because I knew that you got to be really stoic and fight the hunger if you want to lose weight. Because whenever I try to lose weight, I'd always been so hungry that I couldn't sustain it.

And then I saw the names Phinney, Westman and Volek and I knew that they were really good scientists. Because ironically they done the first fat adaptation trial in 1994 and published it and I read it and in 1995, we immediately started doing high fat research and we published subsequently and it was some of the earliest work on high fat diet. So I knew that these people were good scientists and asked the question how could they possibly be involved in the name Atkins because he was the guy who tried to kill us.

Robb Wolf: Right.

Tim Noakes: I realized there was a paradox. There was something that didn't fit. So I went and bought their book and I read it and within two hours, I said that's it. They're on to something and I want to be on that and then I didn't eat carbohydrates from that or I didn't eat much carbohydrate from that moment.

[0:15:06]

Robb Wolf: It's ironic historically and I don't know how many people know this but Robert Atkins when he stumbled on to this idea of a low carbohydrate approach for weight loss and fat loss, it was actually an air force manual for overweight pilots and that was the standard procedure that they just knew that if you had a pilot that was overweight and wasn't going to meet their physical requirements for flight readiness, you put this person on a low carbohydrate diet that they lost weight quickly, easily and it was very, very successful. It was only later that whole paradigm shifted ironically towards something which really doesn't work particularly well but Atkins really was just repurposing something that was being used for the military for quite a long time to keep pilots flight ready.

Tim Noakes: That's remarkable. I didn't really understand that at all.

Robb Wolf: Yeah. You know I'm in a bit of a--I clearly do not suffer the scrutiny that you have suffered but being in this kind of paleo low carb scene, I tried to keep a foot in all the worlds that seemed to work well. For me personally for cognition, for body composition and what not, being on the lower carb side of things definitely works better for myself. I do notice that I try to stay active in some old guy Brazilian jiu jitsu which is a glycolytically based sport. It's about 50:50 glycolytic aerobic. It's basically wrestling. Have you worked with anybody that does maybe a more glycolytic type of physical activity? I know metabolically it makes a lot of sense that as we push time indexing out longer and longer-marathons, triathlons, even these multiday events. It makes more and more sense to be more and more fat fueled, fat adapted but what about for boxing, wrestling, MMA and things like that? What do you think about fueling for activities like that?

Tim Noakes: Yeah, that's kind of the last outpost that people say well it can't work for them because it's like a little concern. Well all I know is that I've had some experience with some athletes who are world class. In fact in one South African swimmer, our best 50-meter swimmer, I think its breaststroke, holds the world record. He's on the start and actually, you wouldn't suspect that what he discovered was that he gluten intolerance but not celiac disease. But he has this generalized discomfort when he

eats gluten and when he stopped eating gluten, he said I could train harder. So he restricts his carbohydrates because he's restricting cereals and grains and I'm not sure to what extent how far he restricts. But anyway he's a world record holder over 50 meters event for the last 20 seconds or so.

Robb Wolf: Wow.

Tim Noakes: It tells me that there are some athletes who can do it and we converted essentially the whole of the Australian cricket team. You think that's funny because the Australians are our biggest competitor. Long story short about how that happened, but it came directly from me and they became the world champions. Of course they're brilliant cricketers. They always have been and I'm not suggesting that diet was the cause but they were floundering on stage and four or five of their key players converted and so that was amazing the effect that had on them and they could now concentrate more easily. The thing about cricket is it's like baseball you have to concentrate intensely for a half second ad there's nothing for 10 or 15 or 20 seconds and then its concentration again and that switching in and out they that's much easier.

They also said that they recovered more quickly and they had more energy when they were playing the game. Of course many of them were insulin resistant even they were young highly athletic people and that benefited. Rugby is one of South Africa's national game which is a pretty explosive sport and you have to be pretty strong in it and we are finding that quite a few rugby players are converting and really benefiting from it. I found also in endurance athletes that there are some who absolutely adapted 100% and they eat 25 grams of carbohydrates a day and they do very, very well and others are put to bed at 25 grams a day. They can't do anything, but you put them at 100, 125 and they've got the best performances ever and the reason for that is I just don't know that it is. It's not quite as simple as saying that worked more glycogen. It's not that simple.

[0:20:03]

Robb Wolf: Righ, right.

Tim Noakes: I think you can classify people into those who do adapt very well to this diet and can do explosive sport and others who cant and I'm profoundly insulin resistant**.** But what I notice with is diet is that I start very slowly and just speed up and up and up and I get stronger towards the finish. No one that I know of eating a high carbohydrate diet gets stronger at the finish or very few do.

Robb Wolf: That’s interesting because I know some of the Steve and Volek's work, Phinney's work. They really recommended more glycolytically oriented folks do a very, very thorough warm up to start enhancing those lipolytic enzymes. So it's kind of make sense that for you throughout the process of an event to where typically up regulating lipolytic enzymes and so it would make sense that you know you would potentially get some boost from that versus if you are really fueled off of this quite sparsely stored glycogen storage. And then we get some of the central governor activity in the brain thrown into that. Once it notices that this very rarefied fuel source is being depleted then clearly performance going to drop.

Tim Noakes: Yeah, exactly. We just actually completely our first study of high fat adapted athletes and high carb adapted athletes and we actually measured liver glucose production which has never been done before because we wanted to show how does the liver cope with a low carbohydrate diet. The answer is extremely well but all it does that because your glucose used by the whole body is so low when you're fat adapted that the liver actually doesn’t have to produce anymore glucose. It's astonishing.

Because you reduced your glucose consumption so much, you don’t have to increase glucose production to compensate for taking little glucose in the diet. But the key was we also biopsied these guys. So they did a two-hour cycle and at the end of hours, the muscle glycogen content was that anticholin in both groups, although of course the high carb group started with twice as much glycogen but after three hours, it was exactly the same. Now the difference was that the high fat guys could burn 1.2-1.5 grams of fat a minute and the high carbohydrate could only burn 0.5 or 0.6. So if this study had continued, it's clear to me who was at the advantage. It was the high fat adapted guys because when the glycogen's gone, they can continue to do very well but the glycogen depleted guys if you're carbohydrate adapted and you can't burn fat, you're in real trouble.

Robb Wolf: Right. It definitely seems like the longer the event goes, the more advantage there is for that fat adaptation.

Tim Noakes: Yes, indeed and I wonder actually many of the so called carb loaded people are also not fat adapted because if you're an endurance athlete running an event that last 12 hours, you're going to be training for five or six hours which means that a lot of your training is done in a carb depleted state so you are partially fat adopted anywhere and going on a high fat diet, just make that adaptation more. I remember this is the

paradox because when I lecture my students and I show them the slides that I used to talk about carbohydrate metabolism during exercise. I realized that when we are carb loading, our goal was to suppress fat oxidation to zero which was ridiculous.

So we were doing everything to prevent fat oxidation, but yet we are also telling people to train to mobilize fat and to use fat. So we were giving this completely contrary messaging that what we were actually doing by taking so much carbohydrate before the race and ingesting so much carbohydrate, we were completely inhibiting fat oxidation or almost completely yet we were also at the same time telling people oh you know you must have fat, you must be able to burn fat because when you run out of glycogen, you need to burn fat. But we weren't giving the athletes body's a chance to burn fat. They were so smothered with carbohydrate.

Robb Wolf: Right. I would venture to say that Phil Maffetone maybe cracked that a couple of two three decades before virtually anybody else did.

Tim Noakes: Absolutely. This is a funny story because--I met Mark Allen who of course was the world's greatest athlete. I met him in Hawaii and I really got to know him quite well and always thought that he was a great athlete and in discussions, it was clear he wasn't committed to a high carbohydrate diet as he wouldn't have been because food was filling him otherwise.

[0:25:00]

But the other athlete, who is equivalent to Mark Allen but is female, is Paula Newby-Fraser. Now Paula is from Durban in South Africa but she was born in Zimbabwe like I was in Harare. She came to South Africa with her parent and in 1994, I met her. She won Ironman in South Africa without training for it. She was just a great, great swimmer but she hardly does any training. She went to Kona and did one Ironman there. I think she came third the first year and they said gosh if you do become third without training what can you do. Anyway, at one time in her training, she phoned me and she said Tim, I've heard about Phinney and the story of burning more fat during exercise.

Do you thing I should eat more fat? So I said go for it, Paula. I think it's great this is 1995. She then went on to a very loaded carbohydrate diet, not that I told her to. I just said eat a bit more fat. I didn't say cut the carbs but she interpreted that I said cut the carbs and eat just fat and she did it all her career and she became the world's triathlete, the triathlete of the millennium that what she was voted. She won 28 Ironman including 8 championships at Kona. I saw her three years ago. She comes to Cape Town once every four or five years and she said Tim, the most

important advise I ever got was when you told me to cut the carbs, eat a high fat diet, which of course I didn't, I was carbo loading at that time. [Laughs].

Robb Wolf: [Laughs]. You can take that attribution anyway just run with that and ignore the real historical story. You know what's funny for my own training is that I find that even doing pretty rigorous jiu jitsu and some anaerobic threshold type work and what not, I tend to do pretty well at maybe 100 to 200 grams of carbs a day. This is if I done two hours of really hard rolling which is about two to three times less in what most folks are doing, you know?

But what's interesting to me and this is where it's really important to customize and individualize and not make a religion with this within the real nutritional ketosis camp then folks are very much trying to keep protein quite low, carbohydrates quite low, trying to maintain a very consistent level of ketosis. I find that I do quite well with that if I'm just focused on cognitive function if I'm doing more aerobic type activity. If I'm doing more anaerobic activity then if I bumped things up to 100 to 200 grams and it's more often closer to 100, I still feel great, the cognition isn’t quite as good because I don’t think I'm consistently in ketosis but the performance is good, body composition is good.

What do we say to folks to try to defuse this, this almost religious approach to it has to be 100% all ketotic or it must be 600 grams of carbohydrates a day. Why is it hard sell to just encourage people to ratchet carbs down reasonably low and play with that and then find where you're good operating parameters are.

Tim Noakes: Yeah. I agree with you. I think that this is a diet for people with insulin resistance like myself. If you want to live a long life, the more fat you eat if your insulin resistant, the longer you'll live. That’s the reason why I would tell an insulin resistant athlete to 25 grams. I'd say you got to sacrifice performance for your long-term health and try to do that. Remember, my dad died of this disease and I've seen what a devastating disease type 2 diabetes is. You really want to keep your control through diet and minimal medication and never use insulin and to do that the more the fat you eat, the longer you'll last. That's my argument there.

However, if you are just insulin resistant but you got normal glucose control then I quite agree with you, you can take more carbohydrate. What we found in that study of the high fat versus the high carbohydrate guys is that during exercise the high fat guys actually burned quite a lot of carbohydrate which was really surprising because they've obviously

stored glycogen from some way probably the glucose that the liver is producing. So they store the glycogen so they're not absolutely glycogen deficient or depleted when they starve.

But the key is as soon as they stop exercising, they just burn fat. In contrast the guys who are eating lesser carbs, burn carbohydrate for the rest of the day. So their high carbohydrate diet is wasted because at least half of that carbohydrate is burned during the rest of the day when they exercise. So I've worked out that I think about 200 grams even if your doing the Tour de France. In other words cycling hard for five hours a day, I suspect you can probably get away with 200 grams a day. I can recall we used to tell people they needed a kilogram a day if they cycle the Tour de France.

[0:30:21]

Robb Wolf: Right.

Tim Noakes: So that's the change. I do work with one or two guys who are nutritionists working with Tour de France team and definitely they move away from high carbs or extremely high crabs and they are eating less carbohydrate than they did in the past.

Robb Wolf: Have you looked at--So some of the concern that floats around in the interweb is that lower carbohydrate diets may suppress thyroid function, may alter testosterone, cortisol ratios via the pregnenolone steal. What are your thoughts on hormonal dysregulation? Is this just a story of needing to find what your individual carb versus fat tolerance is or is there a legitimate bugaboo that we need to be concerned about?

Tim Noakes: Yeah. That's a great question, but in the four years that I've been promoting this, no one has ever written to me and said that the diet caused that to happen to them and no one has ever asked that question so I don't know. Even if it's true, it's not happening to many people. My opinion is that the gluten in the wheat is the real issue and that sets up autoimmune diseases. So I've had in contrast, many people write to me and say once that it cut the carbs and I suspect this that it cuts the wheat, the hormonal state is improved dramatically.

So I seek the opposite. I don't for one moment suggest that what you described can't be happening and might be carbohydrate related, but I would like to see the metabolic pathways involved because I don’t know them and I'd like to see someone explain to me why you need carbohydrate, which is a nonessential nutrient to be able to do those

things. Most hormones in my view are kind of fat related and cholesterol related.

Robb Wolff: Right, right, right. Yeah, it's interesting because with intense training, we do tend to see an elevation in cortisol levels or does seem to be some indication in the literature that say like post-workout carbohydrates suppress that cortisol production, but it's also interesting that ketone bodies dramatically and aggressively suppress cortisol production. So the granularity of the studies, I don't think are currently good enough to really hassle that out. I have seen some folks that doing some things like cross fit plus intermittent fasting plus low-carbohydrate diet.

I've seen some people get themselves into the deep into the pool, but what's interesting to me is that a lot of the people who are willing to do cross fit or intermittent fasting or even a low-carbohydrate diet, they tend to be wired up in such a way that they've quite extreme personalities. They will take a lot of suffering and they end up taking these modalities or tools that could be very, very good as a singular item that you put into your training regimen. They stuck all of them together and then when catastrophe happens, the blame may be gets thrown just on the low carbohydrate portion and not necessarily on the fact that they had poorly periodized programming. They were working to exhaustion and a host of other issues.

Tim Noakes: And they were starving.

Robb Wolf: And they were starving yeah, yeah. I mean , that's uh. Yeah. [Laughs]

Tim Noakes: I would look at type of calorie intake to see…

Robb Wolf: Right.

Tim Noakes: As a big factor in those abnormalities you described.

Robb Wolf: Right. Have you looked much at the gut microbiome because this is another one that it concerns with low-carbohydrate eating that we're not supplying sufficient fermentable carbohydrates for the gut bacteria to remain healthy and robust. Jeff Leach actually studying the Hadza one thing that he has noticed is that they have a really remarkably diverse gut microbiome. But also interestingly, he has commented that these folks do cycle through periods of quite low carbohydrate intake, periods of high carbohydrate intake, but because what they're consuming, there was a great paper and I forget the folks that wrote it, but they made the argument that acellular carbohydrate, basically milled carbohydrates, end

up releasing the bulk of their nutrients in the small intestine that leads to small intestinal bacterial overgrowth and systemic inflammation. They're making the argument that if we stuck more with like yarrow and green bananas and taro root and stuff like that, that we would be much better off. Have you looked into that or any thoughts in that direction?

(00:35:22)

Tim Noakes: Yeah, that obviously understand, but the microbiome is critically important to health and I think that we're moving towards stating that oral disease begins in the gut you know? But I think it's still very early days to say we know what's important. I would have thought that our diet in fact has quite a lot of fiber in it and we do promote quite a lot of fiber consumption. So I agree that people who are extreme and they could reduce their fiber consumption, but it's not something that we advocate.

I'd be really interested to see what else the Hadza do. Because I know that they actually eat the not quite the feces, but they get contaminated by the feces.

Robb Wolf: The offal, right.

Tim Noakes: So from the animals and that might be a critically important factor, which we have removed from our diets. And then I think that the fermented fruits are terribly important and that that might be a key factor just as important.

You know, one of the lovely stories I like to tell is the so-called balance diet. Whenever a dietician tells me that your diet isn't balanced, I say, well actually there's not a single wild animal in the world that eats a balanced diet. The best example in South Africa is the giraffe, which is an enormous animal as you know where it stands and it eats one plant and one leaf and that's the acacia plant. That's it. Now, he took the acacia plant and analyzed it, I'm sorry, you can't say that's a balanced diet.

Robb Wolf: Right.

Tim Noakes: And we know if you take those giraffes and you don't feed them acacia plants, they will die and obviously, they die because the bacteria in the gut change. So these animals have obviously developed a gut flora that's able to convert that little acacia plant, which is nutrient poor into providing all the nutrients they require and that's astonishing. Where do they get the iron from? I mean that's the question I ask.

Robb Wolf: Right.

Tim Noakes: Where do they get the iron from because I doubt there is any iron in acacia plants. I haven't studied it, but I would guess it. So they have to have bacteria in the gut that are providing all these things. So we are really at the beginning of our understanding of what the gut is doing and I think it is providing huge amount of nutrients for us in ways that people -- because we haven't studied it, we don't yet know. I guess it's impossible to study because you have to cannulate the veins coming back from the intestine to see what's present there when you feed different foods and there will be a net positive gain. In other words, you'll be gaining more nutrients than you put in and the only way, you can do that is that the gut flora is producing nutrients.

So when we talk about the RDAs for different substances, how do we know what the RDA is and how do we know that we have to put it all into our mouths when they've got this gut bacteria, which are probably producing, I don't know 10, 20, 30, 50, 100% of the RDA. So this is the future emits and lies there, and I agree. It's terribly important and I would agree with you. I think that eating more fiber probably is beneficial, but then again, it's in the face of a high carbohydrate diet. It's never really been shown to be beneficial because vegetarians haven't been shown to be healthier than people who aren't eating a lot of fibers so that's an interesting paradox.

However, it may well be that if you eat more fiber and you don't eat sugar, and you don't eat a high carbohydrate diet, you may have a huge benefit. So that's the paradox. I think my point is that if you look at the literature, it's very difficult to prove that fiber is healthy and or is essential, but it maybe that fiber is healthy, but it can't overcome the detrimental effects of high carbohydrate diets.

Robb Wolf: Right and you know what, I think one of the points that this dense acellular carbohydrate paper made was that it's a very different process of eating, say like yams or sweet potatoes versus yam or sweet potato powder, or like milled rice starch or something like that. That you're getting in effect that for humans, most of the bacterial fermentation should be occurring in the large intestine, but with processing, we get the bulk of that fermentation occurring in the small intestine and so that may be where some of the problems lie. But it's interesting, we've been hashing out this protein carb fat story for quite a long time and then that maybe largely secondary to the qualitative nature of these nutrients.

(00:40:32)

I just had a gal, her name is Lilly, on the podcast may be 3 or 4 weeks ago and she was talking about gestational diabetes and we have another

layer of this story. The epigenetic changes that we experience, what if you were in a gestationally diabetic state and we know that that is methylating your DNA in a way that predisposes one towards type 2 diabetes and insulin resistance? Now what do we do? Regardless of the anthropological data, what do you individually need to do to be healthy and what I've found again and again for myself, for people working in police military and fire scenarios where they are insulin resistant due to sleep deprivation, we need to curtail their carbohydrate intake or they do not get healthy.

Tim Noakes: Yeah, no remarkable. I just thought of a lovely story to tell you because in -- after I finished my trial, the next few days, I go to a place in South Africa called Pinnacle Point and this is just a magical story. Curtis Marean who works at Arizona State University, he worked out that humans probably were decimated to a very tiny population about 180 to 200 thousand years ago and he said if that's the genetic model. It tells us that we've come from a very small stock of humans and he said where would they exist and he worked out that to exist either in Morocco or the south coast of the my Cape, the province that I live in Cape Province of South Africa. So they said well it wouldn't be in Morocco because the Sahara desert would cut the people off. They could never have expanded through the rest of the world once they started to grow. So I said it has to be the south coast of the Cape Province of South Africa.

So he came here and he went to a place called Mossel Bay, which is probably 600 kilometers from here up the east coast, and after few weeks, he and his students went into one cave called Pinnacle Point and he said this is it. He said this is the cave where the humans survived 200 thousand years ago. Anyway, they have been excavating this cave now for I don’t know 10 to 15 years and they've shown that humans have lived there from then right through to 30,000 years ago and then the story is that he thinks that humans evolved their bigger brains very recently. When I say their bigger brains, I said much bigger brains. There is sudden expansion in the brain size, which happened in the last 200 thousand years. He thinks it happened there because these people were able to catch fish and fish and shellfish and that was so crucial.

So he asked me to come and lecture his group last year because they thought it was actually the carbohydrates that were driving and helped save these people. I told them it's not the carbohydrates, it's the fat and the protein. The story gets even funnier because Curtis after listening to me said, may be he is eating too much carbohydrates so they were more Paleo and he said his health improved dramatically. [Laughs]

Robb Wolf: Shocker.

Tim Noakes: So we have converted one of the great scientists, Paleo-anthropological scientist to the Paleo diet and you would have thought that being in the field, you would have known more about the Paleo diet.

Robb Wolf: You know it's funny, the Orthodox anthropology scene seems almost prickly as exercise scientist and biochemist and whatnot coming in and giving some airplay to our ancestral diet. I gave a talk at one of universities here in where I live and about 50%, basically, I made this point that the anthropologist should be at the vanguard of modern medicine. That they really should be the informants of what we need to be looking at to really parcel this out and about 50% of the crowd was really fired up by that story, really liked it and about half the crowd thought it was complete bunk and didn't like that suggestion at all.

It seemed almost prickly that I was encroaching a bit on their territory. But if you buy into this wacky notion of evolutionary biology at all, whether the story ends up being high carb or low carb or moderate carb or it has regional distributions based off of some more recent epigenetic changes, it still is informed and largely driven by this evolutionary process.

(00:45:23)

So to turn our noses up at that just seems like the most amazing hubris. I can't get over it. But I was reading a couple of books of the early development of Quantum Mechanics and there were near fistfights among the physicists and statistical mechanics folks when they were talking about this new type of physics that really kind of flew in the face of what they have been looking at previously. It didn't seem to provide some really concrete answers the way that we might want them to be and so there was some real anger and dissension in that group. Then now, we couldn't run our GPS satellites without an understanding of Quantum Mechanics and more specifically, general relativity understanding gravity well and stuff like that and being able to reset clocks based off of whether or not they are near the earth surface or in orbit. So you know way a backbone element of our modern world is based off of relativity and to some degree of Quantum Mechanics.

At one point, this was something that the smartest people in the world were nearly in fistfights over. I feel like we're somewhat in that that nascent period where medicine is kind of waking up to the fact that there might be something to this evolutionary story.

Tim Noakes: Exactly. I am just thinking because I know Loren Cordain wrote the foreword to your book and I gather he's not allowed to speak at his university or he's not a speaker on nutrition at his university…

Robb Wolf: Right, right.

Tim Noakes: Because no one listened to him, which came back to my current legal issue. They expect witness for the prosecution. The issue was what should you wean your child onto and I said that you should wean onto a low carb higher fat diet, but real foods that was the key. Not processed foods, you should eat real foods. They complained to us that what's the evidence for it and it's dangerous and you'll kill people. So I said, well hold on, what about the Masai and all these other traditional societies who wean their children onto animal foods and so their answer was well, that's ecological evidence, which is of no value at all.

[Laughter]

Robb Wolf: Because if it's not in a randomized control trial, it just doesn't exist so.

Tim Noakes: That's a randomized control that has been going on for 3 million years.

Robb Wolf: Right, right, right. Wow, yeah, yeah. If you have a hypothesis, I'm not a penultimate scientist, but usually, if there is some sort of a hypothesis thrown out, you have one counterpoint to that that's reasonably robust. I think you usually scrap that idea and then go back to the drawing board and start over again. Am I correct in that?

Tim Noakes: Well, that's what I tell my students. I say the 99 papers that will support you a theory are irrelevant. The one that doesn't support it, that's the one you have to worry about.

Robb Wolf: Right.

Tim Noakes: Einstein frequently said that. He said the one experiment can disprove this hypothesis and he famously said about a book, which hundred scientists against Einstein. So I said why do you need a hundred, you just need one. [Laughs]

Robb Wolf: Right. Wow. So you know may be – so under that anthropological side and observational side, we have these blue zones where folks tend to eat quite a lot of legumes and they also tend to be outdoors. They have strong cultural connectivity and whatnot. A good friend of mine, Chris Masterjohn presented a paper at the Ancestral Health Symposium that

was talking about humans have quite a lot more amylase gene density than other primates and kind of making an argument for humans potentially being wired up for carbohydrate consumption. It was really fascinating to me the folks that have more amylase gene density and usually amylase, you would think about it just being concerned with the breakdown of starchy carbohydrates, but interestingly, it also somehow feeds back and provides better first and second phase insulin sensitivity.

So you know there clearly are some genetic factors where certain folks are wired up to handle more carbohydrates. How do we square that within this whole picture?

Tim Noakes: I think that's a terribly important point. Where we get it all wrong in medicine is we don't teach insulin resistance as the most important medical condition on earth at the moment. I mean I had to discover insulin resistance through reading your work and all the other people. Otherwise, I knew absolutely nothing about it. I was never taught it and I teach it now at the medical school and the students, they've just never heard of this concept of insulin resistance. Oh yes, we know what diabetics, they're insulin resistant, but that's because they're diseased and I don't think so. I think you're born with it and I've got some other theories about how insulin resistance became about, but not's the issue at the moment.

(00:50:40)

The point is that insulin resistance is widespread, but as long as you're not eating carbohydrates, it is utterly irrelevant to your health. You can do fine, but I think what's happens is for myself, having a diabetic family history, I was profoundly insulin resistant and I probably would have gotten diabetes even not eating sugar and eating a little carbohydrate. But there must be a wide spectrum of people who as long as they don't eat any sugar and they don't eat too much carbohydrate, they will be fine and say you look at them, and you say, yeah but they're actually eating 200 or 250 grams of carbohydrate a day. But to me, the key is that those are they insulin sensitive and then they can survive.

Robb Wolf: Right.

Tim Noakes: But the more sugar you provide, the more vegetable oils you put into that community, then that they will become more insulin resistant and then the disease becomes apparent. So I understand that there are populations who do eat lots of carbohydrate. I see them, the canyon runners. They eat 75% carbohydrate diet, but I've seen some world class canyon runners 50 years later, they don't look so great.

Robb Wolf: Right.

Tim Noakes: In fact, they look there it is and so where did they get the insulin resistance from. May be they were insulin resistant already years ago or may be they just developed it late or may be that high carbohydrate diet pushed them into insulin resistance. I think also the problem is if the Mandi tribe or the great canyon runners, I mean I've never seen such lean people. You go in that population, they're all lean, but then they probably just eating a subsistence, just getting enough carbohydrate to survive on and to be healthy, but you give them more calories and more carbohydrate calories and add sugar and add vegetable oils and then it becomes a whole different ballgame all together.

Robb Wolf: And that's where this reductionist approach really becomes problematic ferreting out with a singular cause because it may not be one thing. We know that disrupting photo period is an issue, altering gut biome is an issue, changing the social connectivity, the folks have is an issue. It relates back to stress and stress propagates cortisone, cortisol antagonizes insulin sensitivity. So I think that that's were a kind of evolutionary biology approach that looks at all of these factors and I'm sure that there are factors that we have not even considered in this very complex equation. You know that's where we need to start looking and again I think to your point that when we see pathology related to hormonal dysregulation in that insulin axis, then clearly restricting carbohydrates down to a level where we don't see pathology seems like kind of a slam dunk.

My possibly weak analogy with this is that I'm Scottish and Swedish in lineage and so I have some melanin in my skin. I tan up reasonably well, but there are people who have much more melanin into their skin and they will tolerate a given amount of UV exposure far better than I do. So why is it not controversial that we have folks that can tolerate UV exposure or people with sickle cell anemia can better tolerate a pathogenic load of malaria better than folks without heterozygous sickle cell alterations. Why are those topics not controversial, but the idea that we may have some genetic and epigenetic issues that lead in insulin resistance, that is controversial.

Tim Noakes: Because it comes back to carbohydrate.

Robb Wolf: It comes back to carbohydrate, yeah.

Tim Noakes: It comes back to the 1977 dietary guidelines, which unfortunately are set in stone where it looks like not set in stone, it looks like they're going to change, but they have been set in stone for 50 years.

Robb Wolf: Right. This gets a little off topic and reasonably political, but the United States has expanded this kind of junk carbohydrate scene, I would say really aggressively jumped into it in the 1970s and we started subsidizing our food production. Most other countries on the planet are not set up either militarily or economically to undertake activities like that. Why on earth are places like Australia and South Africa and other locations, why are folks buying into our mess? Why are they taking that export, which is doomed?

(00:55:34)

Tim Noakes: Because we have an inferiority complex and we think that everything comes out of America is better. I think that's one of it, but I suspect there's political pressure as well.

Robb Wolf: Right.

Tim Noakes: And all those weak, wheat exports. There must be some political pressure that is used.

Robb Wolf: Somebody apparently needs to eat it, yeah.

Tim Noakes: I think wheat has some political clout clause with it to the counties that import American wheat.

Robb Wolf: Right, right.

Tim Noakes: They're not speculating, but I do know it's 9 billion dollars a year of wheat exports around the world.

Robb Wolf: Wow.

Tim Noakes: What I do know, that's what I've observed which is really interesting, of course, vegetable oil is the same. Vegetable oils are America's a major export of vegetable oils. So if you're a scientist in North America, you will not stand up against wheat or vegetable oils, you can't because you will be destroyed. But if you're living in Europe and you're importing the stuff, then you're not got quite the same academic pressures on your scientific or industrial pressures to support these products and why is it that the scientist in Europe have been the first to come out against the fact that fats cause heart disease.

Robb Wolf: Right.

Tim Noakes: It wasn't the Americans. It was the Europeans and I think it's because for some reason, they escaped the control that exists in the United States and the scientist and what they can't say about the dangers or different diets.

Robb Wolf: There is a great story, a guy Ricardo Salvador, was going to take over the Leopold Institute of Sustainable Agriculture at Iowa State University. He had gone through all of the vetting and running the gauntlet necessary with kind of climbing the ladder in an academic setting and the day before he was to be installed in this position, he was giving a public lecture and he just somewhat offhandedly said, cows evolved to eat grass and the next day, he was dismissed. There was a huge uproar over this whole thing and Iowa's one of the possibly the largest recipient of subsidized farm money of any state in the country.

And then when Wendy Wintersteen, the dean of the School of Sustainable Agriculture was being interviewed on this topic, one of the reporters said just kind of point blank, are cows evolved to eat grass and she said, I don't have a comment on that.

One cool thing with the internet, we can get stories like this out and kind of shine some light on that just appalling ridiculous process that's going on. But it's also really an eye opener that somebody who is an incredibly respected academician in their field talking about something that should be as, this is unreasonable saying giraffes evolved to eat acacia, like there shouldn't really be much controversy there, but clearly, there can be. Well Professor Noakes, where can folks track you down on the internet. You have quite a number of websites. Where can folks track down more information?

Tim Noakes: The best one is one we're about to launch in a week's time called thenoakesfoundation.org and that's all the money I get from writing and speaking is going to the foundation. Our goal is to support nutrition research and understand insulin resistance and how we can reverse it and prevent it and that's my focus now. Because my dad died from that condition and I've got it and I see this as the most important condition globally now. It's more important than HIV, tuberculosis and many of the other diseases, which of course are horrible and terrible, but insulin resistance is the one that's taking humans down and we have to do something about it. I believe we know what the course is and I believe we know what the prevention is. But no one's got the courage to come and say this is what we have to do reverse the diabetes epidemic. So we want

to support really high quality research that will allow us to say, there you are. We showed you. You can reverse diabetes. This is how you do it and that's why it happens.

Robb Wolf: Right. Right.

Tim Noakes: So we can reverse it. We can prevent it because the same, we just got to take out the causative agents.

Robb Wolf: I like it and I'm so honored to have you on the podcast. We will be following your process with the inquest very, very closely Professor Noakes. It was a huge honor to having on the show.

(01:00:14)

Tim Noakes: Robb, it was my honor and my privilege. Thank you so much for having me.

Robb Wolf: Thank you and I'm hoping to get down to your side of the world here next year. So I would love to take you out for some low-carb, high-fat, good grass fed protein wherever we can track it down.

Tim Noakes: Cape Town is known to be the banting capital of the world and so banting of course was the first guy who wrote the book in 1962.

Robb Wolf: Right.

Tim Noakes: When we write our book Real Meal Revolution, we called the diet the banding diet, not LCHF or Paleo, we called it banting and we have a whole bunch banting restaurants in Cape Town specifically. So there is nice shortage of good restaurants to provide the foods that you requested.

Robb Wolf: Great.

Tim Noakes: I will take you out there.

Robb Wolf: I'm buying when we go down there. So that sounds fantastic.

Tim Noakes: Thanks so much Robb. Lovely to chat to you.

Robb Wolf: Thank you. Take care. We'll talk to you soon.

Tim Noakes: Sure. Bye.

(01:01:22) **End of Audio**