



Transcript of “Hacking Your pH, LED Lighting, and Smart Drugs with Steve Fowkes Part 1”

Bulletproof Radio podcast #94



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Dave: Today's cool fact of the day is about liver. In particular, polar bear liver. If you eat one you are going to die. We don't handle vitamin A very well. You can have a little bit of it, in fact, I even recommend you have a little bit of preformed vitamin A but too much of it is a bad thing. Vitamin A is a crucial building block for lots of animals. You need it for your eyesight, for reproductive tissues, for fetal development, for growing, for immunity and even to form new cellular tissues and the tolerable upper limit for adults is at about 10,000 IU and people tend to show some toxicity at around 25,000 to 33,000 IU. When you don't have enough of this stuff you can find yourself facing symptoms just as bad as those that happen when you have too much of it. Deficiency in vitamin A can cause dry skin, diarrhea, blindness, retarded growth or even death. The funny thing is that polar bears themselves aren't immune to consuming too much or too little vitamin A. If they have too much they get the same problems. If they have too little they have the same problems. The difference they have is that they have a much higher tolerance. If you compare a human liver which has maybe 575 IU of vitamin A per gram with a polar bear's liver, you are going to see it has 24,000 to 35,000 IU per gram which is why you actually shouldn't eat polar bear liver.

It's Dave Asprey with Bulletproof Executive. I just had a shot of espresso made with upgraded coffee beans so I am talking a little bit fast and I apologize for that but it's worth it because I needed to maximize my brain power for today's guest. He is a total badass. Before then though I want to say thanks. Thanks because you've made this podcast number one on iTunes and I really appreciate it. If it's been helping you, I'd also appreciate it if you would go to bulletproofdietbook.com and registered in order to get a copy of the Bulletproof Diet Infographic for free and the first chapter of my book for free. This is going to help me go to publishers and explain to them exactly how many people want to read the bulletproof diet book so I can get the right book deal. I really appreciate your support there,

bulletproofdietbook.com. And now, who is this amazing badass we are talking about? This is a guy who, probably the only guy I can say literally saved my career and this is Steve Fowkes who is the master of smart drugs, the author of Smart Drugs and Nutrients II. He blogs at Project Wellbeing.com and executive director of the Cognitive Enhancement Research Institute, the CEO of Nanopolymer Systems Corporation, a co-founder of Vitamin Research Products, this company that introduced major nutritional products like DMAE, selenite, BHT and tyrosine to the whole industry. These are things that you see written about all the time. I talked about using pyroazine. This is now 20 something years later. He has a bachelor's in organic chemistry, he is a former pyromaniac child. The books he's written include Wipeout Herpes with BHT, by the way that rocks, the BHT book, and he knows something about Alzheimer's disease because his grandfather passed away from Alzheimer's. It helps that maybe he was a dentist and smoked and had emphysema that contributed but Steve knows things that I don't know and his influential newsletter series called Smart Drug News is what turned my brain on. When I first started having brainfog in my early 20s I went to UltraVista because Google really wasn't around then and I found Steve's newsletters online and I read every single one of them and I bought the stuff he recommended. I had to order it from Europe at the time. It turned my brain on enough to keep learning and to go down the path of [inaudible 00:04:01]. So Steve, thanks man. I appreciate that and I appreciate you coming on the show today.

Steve: You're welcome.

Dave: It also helps that Steve, you are a regular attendee and advisor to the Silicon Valley Health Institute, the anti-aging group that I am the chairman of. Every month, if you are in the Bay area on the third Thursday, you can go to Palo Alto at the community center there and you can actually see Steve in real life. He has this aura around him that comes from all the smart drugs he's taken and there's a circle of people asking him questions all the time. This is pretty accurate, isn't it Steve?

Steve: Yeah.

- Dave: Maybe the aura I am exaggerating but he is an incredibly well-acknowledged expert and someone who's accessible to the community and he runs Project Well-Being meetups as well. Steve, really I'm in your debt and I asked you to speak at the first Biohacking conference that we put on last year and we'll be doing another one this year and of course you're perennially invited because you have this massive skill set. Welcome to the show, man.
- Steve: Thank you. It's great to be here and let's have some fun.
- Dave: The reason I invited you on is that I think we could talk about 50 things but you are into hacking Ph in a way that I'm not. I take alkaline water, it gives me the runs. I think a lot of the alkaline claims don't make sense to me and the human body is a battery. If some parts are not acidic they don't work very well. That would be your digestion. Other parts of you need to be alkaline and there is a delicate balance and think a lot of the marketing stuff I have seen, all the various things I have tried haven't worked out that well but I haven't tried your protocol. You've given some fantastic talks about pH and circadian rhythm so we are going to talk about acidity and alkalinity and get your take on it because you have the most rational scientific approach to this I've come across and there's a lot of like woo-woo, you know, alkaline water blessed by fairies and stuff like that. So first off, is fairy blessed water better?
- Steve: In my opinion, no. I mean, it might be to some people a slight source of reducing equivalents so you know we live in an oxidizing environment and we need reducing equivalents to stay alive but the problem with water is that it doesn't carry much. It's like all voltage and no amperage and therefore if you put one drop of an oxidizing agent in it the reducing power of the water disappears so it really isn't the same thing as let's say eating a pineapple guava where you're going to get a gram of vitamin C and that that's going to have better reducing effects on your body or the alternative of eating MCT oil or coconut oil and having it rev up your mitochondria which will produce reducing equivalents dynamically at the cellular level.
- Dave: I understood all of that but I think everyone who's listening to the podcast right now driving in cars either ran into a median trying to

think about it (laughs). So, let's break that down, so to speak, electrically and let's talk about why reducing matters to people and what ... Just explain what reduction is in layman's terms so we can start to talk about why alkaline water or other alkalines being herbs or diets might be helpful.

Steve: Okay. I think that that's easy to do with a temperature and color analogy. You know we live in an environment where the outside world is oxygen. It's an oxidizing environment and you think of it as being hot or think of it as being red which would be a color of heat and it's a fundamentally dangerous environment. When you go into our bodies and look at what happens down at the cellular level, it turns out that our bodies are cold and blue and that there's that fundamental antagonism that we have to defend that. We have to keep our body temperature cold in order to survive and that is the energy that we extend in our life. We bring in fuel, we burn it, we get rid of CO₂, we use that energy to keep our bodies cool so that the oxygen in the atmosphere isn't dangerous. It can be cleanly directed through the mitochondria to produce energy without damaging our DNA, our proteins, our minds, you know other kinds of sensitive molecules in our body.

Dave: Okay, and the act of reduction there is ... What are you doing specifically with the oxygen?

Steve: Well, you're not doing anything with the oxygen so much as you're just channeling the oxygen in a way where the oxygen can't accidentally damage something that's critical like your genes or important proteins or structures in your mitochondria where you're generating energy. In a sense you can think of it as a kind of [inaudible 00:09:00] where the universe is disordered and our bodies are ordered and thus we're using that energy to create order and so we're borrowing order from the universe to keep it in our bodies and we're dispersing disorder into the universe and that takes energy to do it and oxygen is the source of that energy. But, because we are highly reduced environment, we're a very cold environment, a very blue environment, that surrounding heat, that redness and energy and heat is a potential threat to our systems and so when we lose that ability to keep our bodies cold, we end up dying and this is the process of life. We have to ... we have to borrow energy from

the world in order to keep our structure intact so that we have the knowledge in our brains and the structures in our body and the health of our vascular system and etc., etc.

Dave: Okay, that makes sense in the act of reducing something there is basically maintaining that balance between the energy of oxygen and the destructive oxidizing nature of oxygen.

Steve: Yeah. You can think of it as a refrigerator ...

Dave: Okay.

Steve: An antioxidant is like an umbrella that protects us from the sunlight so it doesn't really cool us it just prevents us from heating up from direct sunlight but the mitochondria are like a refrigerator. It's actually cooling our bodies down and we need that refrigeration. If all we had was antioxidant protection we would not survive. We need to have that actual drawing down of the temperature below baseline so that we can then cool off the hot spots of our body which would be caused by free radicals or by cosmic rays or by eating rancid fat or having an infection or being allergic to a wheat protein, you know, that kind of thing.

Dave: These are different environmental stressors. And what does an environmental stressor do to your pH?

Steve: Well, typically it's acid stress.

Dave: Okay. So an acid stress comes in and increases acidity of the body and what impact does that have on our ability to stay cool so to speak but our ability to effectively operate as biological creatures?

Steve: Well, we need to have a certain pH range in which we operate for ourselves to be healthy and it's somewhere around the vicinity of 7 in terms of our body and somewhere around the vicinity of 6 in terms of our urine because our bodies do produce enough extra acid that we need to dump that acid in our urine and so our urine shows a net acid influence from the pH of the rest of our bodies.

- Dave: Your blood and most of your meat should be around ... and probably your saliva then should be around 7 and your urine should be around 6?
- Steve: That's right.
- Dave: Okay.
- Steve: And so by studying that dynamic you can get some insight into how your metabolism is working, so for example during the day we run a large net acid production because our mitochondria are tuned up, our immune systems are highly active, we can run into things, we can get bitten by insects and by snakes and lizards and spiders and we can run into antigens, you know, viruses, bacteria, that kind of stuff, all of that requires us when we're out in the world to have an active defense mechanism which is our immune system and so our immune system is highly active during the day and it's driven by acidity and our energy system when it goes into high gear during the day that produces the net of acidity so that's part of our natural rhythm and when that acidity is being generated our kidneys are taking the blood that's going through and any extra acid that's being generated and dumping it into the urine. After the day is over we go into nighttime mode, this is when we're sleeping and this is when we're repairing. We need to be alkaline at that time so our energy systems drop down so the acid that is being produced by our energy systems goes down and then our kidneys will start conserving acid to keep us balanced so our urine will go from let's say 5 which is ...
- Dave: Which is acidic.
- Steve: Ten times more acid than average to pH 7 which is 10 times less acid than average, and so we can see this kind of tide where we swing from acid during the day to alkaline at night and this is a natural rhythm and if this doesn't happen you are at risk for developing cancer and other degenerative diseases.
- Dave: Thank makes a lot of sense, Steve, and the idea that we're changing on a daily basis. I mean, we have almost every hormone that we have goes

through a circadian rhythm so why wouldn't our acid/alkaline balance and probably also our CO2 reserves ...

Steve: Yes.

Dave: Also which affect acidity very directly you get those from breathing. Those also probably have a cyclical thing. Is it just directly tied to acid/alkaline the way you're asking or is your CO2 separate because you breathe differently when you're sleeping so your CO2 changes or is that just a part of the acid of the body?

Steve: Well the body balances its breathing based on pH control. You know, most people think since we're breathing oxygen and we need to have oxygen from the air that our breath is controlled by regulating oxygen. Well it isn't at all. There isn't an oxygen sensor in the brain that's controlling our breathing, it's actually controlled by carbon dioxide which is the by-product of oxygen and so if your CO2 goes up you tend to breathe more to get rid of it and if your CO2 goes down you tend to breathe less to conserve it and that's all built into the wiring of the nervous system, the autonomic nervous system.

Dave: So what happens when I drink what I happen to be drinking now, San Pellegrino, which is relatively acidic. It's full of carbon dioxide, right, but it does have some calcium, magnesium, some sulfite ... sulfate in it. What is ingesting CO2 to the GI tract do to this whole balance? Am I completely jacking it up?

Steve: You are jacking up your CO2, absolutely. This is a great self-care test to experiment with yourself, would be to look at something in your life that would be directly related to CO2 levels and my suggestion would be breath hold time.

Dave: Um-hum.

Steve: How long can you hold your breath? If you just take a deep breath and hold it when do you have to breathe? Is it 30 seconds later ...

Dave: [inaudible 00:15:42]

- Steve: Is it a minute later, is it a minute and a half later? That makes the difference because if your CO₂ is low you can hold your breath longer. It takes longer for your CO₂ to build up because it was starting at a lower point but if you drink a bunch of CO₂, water or you take some baking soda that would have CO₂ in it raising your CO₂ up then you can only hold your breath for a short period of time before you get that feeling and the CO₂ forces you to take a breath.
- Dave: It's interesting. I tend to have high CO₂ in my blood. I don't think it's from drinking Pellegrino. A bottle a day isn't that much, but it's funny, I should be excessively acid according to most of the nutritional people telling us what to eat because I eat meat and fat and all those ... coffee, all those evil things, bacon, but I'm consistently alkaline to the point that if I take baking soda or even too much magnesium I start panting at night like it doesn't feel good, which is one reason why I'm kind of suspicious of these people who say well if you burn your vegetables and test the pH of the ashes that is what happens in your body. Is there any rationale to that?
- Steve: Oh yeah. I mean that does happen but the regulation of pH is a higher level function and so for example if you are parasympathetic, sympathetic balanced and your heart rate variability is in the green zone ...
- Dave: So what that means for people listening is we're talking about fight or flight response.
- Steve: That's right. So if you go into fight or flight response that sympathetic activation that causes you to breathe more rapidly and to breathe shallow and that blows off carbon dioxide, okay, so CO₂ is ... CO₂ release is dependent upon the style of breathing. If you're breathing shallow then you are blowing off CO₂ and if you're breathing slow and deeply you're conserving your CO₂ so being centered and not being nervous is actually ... it influences your resting CO₂ level ...
- Dave: That's why it's high.

Steve: So if you go into a doctor's office and you get a CO2 assessment, you're typically measuring yourself in a highly stressful environment, the white coat syndrome, and so you tend to be breathing more and in terms of driving through traffic to get there and waiting and the issue and being irritated because you're appointment is 25 minutes late and these kinds of things, you will tend to blow off more CO2 and that'll influence your readings. Some of these kinds of tests aren't particularly useful but when you take it into your own home and you start studying things like your breath hold time and how it responds to different things that you might do, you can actually learn a lot about what's going on with your metabolic rate.

Dave: Interesting. So a potential biohack for people listening would be once a day when you wake up or when you go to sleep, hold your breath for as long as you can. But there is a training effect too, if you do that regularly you would just get better at it.

Steve: There is. I was a lifeguard and a swimmer in college and I could hold my breath for two minutes easily and even though according to my metabolic type I should have been able to hold it for 45 ... a minute ... 45 seconds to maybe a minute, a little over a minute. I could hold it much longer because of that training. The point is though that it's not so much about how long you hold your breath, it's about how it changes dynamically for you. It's all about you, so if you can hold your breath for a minute and a half then you're looking at only being able to hold it for a minute or being able to hold it for two minutes as being a significant change in your CO2 state, whereas if you can only hold it for 30 seconds, then going to 40 seconds is a significant change in your CO2 state.

Dave: Okay. So then is it because I'm too alkaline that I start panting when I take baking soda or something like that? I feel like I just have to breathe really shallow, really fast breaths.

Steve: Yeah, you're blowing off ... well no. That would just be CO2 loading.

Dave: Okay so I'm adding ...

- Steve: You can load CO₂ with baking soda and you can load it with carbonated water and one's alkaline and one's acid but it's still a CO₂ load.
- Dave: Okay.
- Steve: So that would tell me that it's all about the CO₂ for you and whenever you drink carbonated water or you're taking baking soda, you're just loading yourself up with CO₂. Now, you could take an alkalizing agent that didn't have any carbonate in it and see a totally different effect.
- Dave: Interesting. So I need to play around with that. What would an example of a non-carbonate alkalizing agent be?
- Steve: Lemon juice.
- Dave: Okay. [inaudible 00:20:12]
- Steve: [inaudible 00:20:12] seaweed.
- Dave: Isn't lemon juice acidic?
- Steve: Well it's acidic on your tongue and it's acidic to your stomach but it's alkaline ash when it burns in your body so that's again going to that kind of question, so lemon juice would be tart on your tongue and therefore you might think it's acidic but it's not, but the ash is very alkaline but seaweed is even more alkaline than that and that doesn't have any acid or alkaline taste to it at all.
- Dave: If you put a pH meter in lemon juice though it actually is acidic?
- Steve: That's right.
- Dave: The body doesn't burn things. If it did we could eat candles and we'd be totally happy on that, so why does what a chemical reaction that doesn't happen in the body ... if we do that to lemon juice, why does that tell us what's going to happen in the body. I'm very skeptical that that is a reliable 100% accurate indicator, like you burn your food and it can tell you what it's going to do in your body, because we don't do that.

Steve: We burn food, so you burn the carbohydrates and the citric acid, things like that in the lemon juice, and there's also other kind of residues in the lemon juice that would be left over, so if you have let's say potassium, that's going to change your pH and so once the fruit acids are burned off depending on how they go, you're either getting an alkaline effect or an acid effect from it that will ... the ultimate pH that you're left with is more about the ash than it is the pH of the food itself.

Dave: Okay, so the point there ...

Steve: Let me give you an example. Citric acid, very tart, pucker your mouth big time.

Dave: It's an acid.

Steve: Rearrange the carbon and hydrogen atoms and you get sugar, not tart at all.

Dave: Right. So, the question there is whether a combustion process with heat is leaving the same residue as a metabolizing process. I've always been suspicious of that but I've never had great evidence otherwise. It seems like the reactions that are driven by high temperatures when you burn something are just not like what happens in the body so the residues would be different in the body.

Steve: They are alike in terms of O₂ and carbon in and hydrogen in and water and CO₂ out, they're alike in that respect, but you're right in the sense that let's say if you are anaerobically dominant at the time that a food comes in, the sugar is going to burn to lactic acid instead of burning to CO₂ ...

Dave: Alright.

Steve: And that's going to affect your pH balance because CO₂ flows from the cell out through the tissue to your lungs and is efficiently mobilized and flows from your body whereas lactic acid comes out of your cells and sticks in your tissue and doesn't move very well so that's your classic acidic American body type from the traditional Chinese medical kind of message and that's why most people will say alkaline, alkaline, alkaline

is the way to go and they are not recognizing that they are only talking about one layer of the body and under that layer and above that layer you also have pH effects that are not at all connected to it. It's not uncommon to see somebody with lactic acidosis on the tissue level have blood alkalosis.

Dave: Interesting. So now I'm sure some people listening to this are lactic, acidic and their eyes are crossing because we're getting pretty scientific pretty quickly here.

Steve: Yeah.

Dave: There's a point to all of this though that is really worth understanding and it's that you can measure your pH at different times of the day and that's going to tell you tweaks that you can make to your diet to increase your performance, increase how you feel and increase even your health level. What's the best way that someone listening to the show could go out today or tomorrow and measure their body's acid/alkaline balance by pH. What's your recommended method?

Steve: Well, it's not something that people should do if they're not really dedicated because when you want to measure your pH because it's a dynamic rhythm, you need to measure it every time you pee and typically for three to five days in a row in order to be able to verify that the acid and alkaline swings that are taking place on one day actually correlate with the swings the next day and the day after that. In a sense you're looking at your overall pH rhythm rather than looking at the fact that you had salad for lunch one day and chili for lunch the next day.

Dave: It's sort of like when women track their morning temperatures for ovulation calculations. The day to day changes might not be that important but you can tell when overall it's climbing or overall it's falling.

Steve: Yes.

Dave: So this is something for people who really are willing to spend a week understanding how their body works but listening to this show we have

all kinds of people who, you know, they drink [inaudible 00:25:17] every morning because they feel better, they wear a Nike fuel band or a Basis band, they're doing all kinds of stuff because they're willing to invest that. They're the kind of people who come to Silicon Valley Health Institute. Let's assume that people listening are willing to basically carry around a little bundle of sticks or something else and every time they pee measure it, what do you recommend? Is it a pee thing or is it a saliva thing?

Steve: Well I recommend urine just because I understand it better and so if somebody does some urine measurements and they submit the data to me I look at it and I can make sense of it faster.

Dave: Got it. You recommend people pee on a strip and write it down?

Steve: That's right and track it over time and if you collect your pH data on one side you want to collect how you feel on the other side. You know, I'm feeling plus, better than average; 0 neutral; negative, worse than average; negative negative, I'm really ... you know, can't get out of bed this morning. That kind of data can help and also tracking when you drink a cup of coffee, when you eat a meal, whether the meal is high protein or low protein, whether it might contain let's say wheat and you might be allergic to wheat, all of these things can be correlated with the urine pH changes so that you can learn by associating some perspective cause with an effect.

Dave: Okay.

Steve: This is all a learning process. Now, for those people who aren't willing to be ... to dedicate their life to this kind of thing, because carrying around pH papers with you all the day and having to think every time you need to go to the bathroom, oh, measure my pH, you know, and have a notebook to write it down ...

Dave: It's good for five days.

Steve: It's a lot of overhead.

Dave: Yeah.

- Steve: And if you're at work you've got a contract that's coming up, you've got some deadline, how much of your coping power can you dedicate to this kind of thing can be a real challenge ...
- Dave: [inaudible 00:27:13]
- Steve: For those people who aren't in that kind of position, there's a general rule about pH and it has to do with how you handle your energy. Do you produce energy aerobically or anaerobically which makes a huge difference on your pH control and in terms of how you handle alkaline food. Do you handle it gracefully or does it derail you? So if you are ... let's say you've got multiple sclerosis or some kind of autoimmune disease, chronic fatigue syndrome, and you eat something that's highly alkalizing, it's likely to derail you. It's likely to make you feel really, really bad. Especially if you do it first thing in the morning. So that tells you that if you're paying attention to this, just not bothering to measure your urine but paying attention to the kinds of things that I'm describing, you can say okay I'm having a problem generating acid and generating energy. The energy I'm generating is going into lactic acid instead of CO₂ and therefore, the alkalinity that I'm putting into my body is overwhelming my ... it's not balanced with my acid-generating system. On the other hand if you are aerobic, you're now ... when you eat a high alkaline meal your body can raise its energy level to balance it and it doesn't derail you at all and you actually feel better.
- Dave: So for people who are say endurance athletes or people who are exercising a lot, then they're probably going to benefit more because they tend to be in an aerobic mode more often?
- Steve: They'll be in aerobic mode more often.
- Dave: Right. You have to be in aerobic not anaerobic.
- Steve: Yes.
- Dave: Good catch there. That could be off a little bit on the radio.
- Steve: And they're the kind of people who would thrive on a highly alkaline diet. They'd be able to eat fruit, they'd be able to eat veggies and raw

veggies and lots of veggies because their aerobic capacity would be augmented by their exercise.

Dave: So now here's the weird thing. The bulletproof diet recommends like nine to 11 servings of vegetables. I eat tons of vegetables and I've got like pro athletes like world champions who are on the bulletproof diet and it's totally upping their game but they're eating tons of fat, not these alkaline breakfasts, they're doing classic bulletproof coffee, right, and coffee isn't considered an alkalizing food last I checked, right?

Steve: No, it is. Coffee is highly alkalizing.

Dave: It is?

Steve: [inaudible 00:29:41]

Dave: It's been a while since ...

Steve: It's a boomerang food like chocolate. Coffee and chocolate have this two hour acidifying effect and an eight hour alkalizing effect afterwards.

Dave: See, I didn't know that about coffee. There's not a lot about coffee I think I haven't read but I would love to see like any data on that because that would be an amazing post. So you get two hours of acidity in the morning and that's going to probably make you feel good because you're turning on your acid in the morning because you want to essentially turn on your immune function and go out and seize the day, and then the alkaline there is enhancing endurance essentially?

Steve: Well it can. There's some really interesting stuff that's been done by people who've been experimenting. They've shared this kind of stuff with me that if you approach exercise and you know, people have an inclination to exercise or not, if you're in an acidic state you're inclined to exercise. If you're in an alkaline state you're inclined to just kick back and relax, and so what they found is that if you take something that is acidifying prior to exercise you go into the exercise better. You initiate the exercise you're more enthusiastic about it, but you also hit the wall faster and so the people with the best results do acidification prior to exercise and then immediately once they've started the exercise, they

alkalize at that point and that gives them the stamina to withstand long-term exercise.

Dave: Wow. You just got this from data because you are like the master of biohacking some of this stuff, stuff that I haven't done like acid/alkaline pH. Like I've played it it. I have digital pH meter and all that stuff but I've never graphed it out like you have. This is where that data comes from. There isn't like a formal study of that?

Steve: No.

Dave: Alright.

Steve: You know that there is from the perspective of lactic acidosis as the pathology associated with long-term exercise, so people hit the wall because they burn through their glycogen, they hit the wall before their fat burning turns on or they get the burn that happens from lactic acidosis and these kinds of things are recognized as encumbering factors for people working out, especially peak performance.

Dave: Wow. This is a totally ... I've never seen this published anywhere. The first time I've seen it in public, the thing about coffee, and that's really cool, Steve. I have to learn more about this but we probably don't have to dig in further on that one on the show, but that does explain why some of these incredibly high performance athletes are really into it. What about using brain octane, the extra MCT oil or even just regular MCT oil at different times of the day? Does your acid/alkaline circadian rhythm affect what the best times are to take something that's going to give you more BHB co-enzyme A and ATP?

Steve: Yes, absolutely. And so that would make a difference, for example, in terms of your bulletproof coffee where you're getting butyrate or MCT oil and depending upon whether people are using butter or not, and that will rev up your metabolism and help shift you from a low energy, low metabolic state at night when you are sleeping into a high energy state of the day, so there's that transition from alkaline to acid, from low metabolic rate to high, from low CO₂ to high CO₂, that can be facilitated and so it matters for you whether or not you are in tune with that

process or that process is late. If you're a night owl for example, that process is going to be delayed two to four hours, so when you wake up in the morning you're still metabolically kind of asleep and that's that groggy, oh God I've got to get out of bed, where you need an alarm clock and that kind of thing. Then you have the opposite people who are the morning larks that just pop out of bed, bright-eyed, bushy-tailed ...

Dave: Those people.

Steve: Yeah. No prejudice on this show, right. Okay. Those people are making that transition from alkaline to acid in the late stage of the morning before they're actually waking up and so they pop out of bed and for those people you have a totally different pH pattern. Their acid momentum is fully developed, whereas a night owl type is retarded.

Dave: So if you're an early morning, catching worms kind of person, what's the best time to drink your bulletproof coffee?

Steve: It might be never.

Dave: No, don't say that, Steve. Because these are people who might not benefit from coffee at all.

Steve: They're naturally doing bulletproof without the coffee.

Dave: Okay. From a CO2 perspective, right. But what about like the anti-inflammatory stuff that's present in there, the polyphenols and all those things?

Steve: Yeah. It probably would be best to spread it out throughout the day because their acid momentum is already going.

Dave: Let's actually separate it out. Okay, there's the coffee, there's butter and then there's MCTs. We can talk about those different components. So let's say that you're one of these people and that you've pee'd on a stick for a while and that you tend to be acidic when you first wake up in the morning. You wake up at 6 a.m. and you're ready to seize the day. You go to bed at 8 p.m. Because you turn into a zombie at night. Okay so

you're like the opposite of me. If you're one of those people, what's the best time for butter, best time for MCT, best time for coffee?

Steve: I would say later in the day. It would either be lunch or dinner.

Dave: Okay, so these guys might actually ... this is interesting. So if you were going to do ... I think you know about the bulletproof intermittent fasting, when you start your fasting zero protein, zero sugar, just bulletproof coffee in the morning and then you just don't care about food. So these guys might actually benefit by having a full breakfast and then ...

Steve: Or an alkalizing breakfast because, let's say if you're rhythm is shortened, instead of having a 25-hour biological clock like you or me, they have a 23-1/2-hour biological clock so they tend to fall asleep in front of the television at night or a little bit earlier every night and so for them going to sleep is not the problem. The problem is they wake up at 4 a.m. or 3 a.m. They're just too much so they want to lengthen their day so when they are swinging acid in the morning, if they have fruit for breakfast or veggies for breakfast, they eat let's say some spinach for breakfast, that's going to bring down their pH and extend their day.

Dave: But wait, how is fruit going to do that to their pH? I thought fruit was supposed to be ...

Steve: It's an alkalizing influence [inaudible 00:36:18]

Dave: Aren't they already ... I guess they're already super acidic so you want to ...

Steve: No, they have acid momentum so their staking an alkaline food on it so, for example, somebody who wanted to do something that wasn't with sugar could do milk for breakfast because milk protein is a ... tends to be an alkalizing protein or they could do beans for breakfast where the bean is an alkalizing source of protein, ignoring the leptin and other ...

Dave: All the reasons you shouldn't eat beans and milk protein.

Steve: I'm just talking about it ...

Dave: I get it.

Steve: At a superficial level and the body of course is three-dimensional instead of one-dimensional but ...

Dave: This is just an acid/alkaline discussion, right. I get it. I still stand and say that milk protein, at least most milk protein outside of certain whey and beans are generally not the best foods for human performance, but your point there about eating something different in the morning can make a lot of sense. You're one of these people and you wake up in the morning and you want alkalinity but you want to stay in ketosis because we know that ketosis increases brain function, it's anti-aging and it's basically a cool state to be in at least five days a week. So, if you want to do that and you want to have an alkalizing breakfast what do you do?

Steve: I'd eat some raw greens.

Dave: Raw greens, okay. But you're getting all the oxalic acid. Raw spinach leaves a film on the back of your teeth which is your body trying to dump those extra acids like a kidney burden, kidney stones, all that stuff.

Steve: You can do a green juice.

Dave: Okay, green juice. Why wouldn't you just take a little bit of baking soda and then drink your bulletproof coffee and be done with it?

Steve: Well, because bullet ... because baking soda is a shallow alkalizing agent ...

Dave: Oh, it's not ...

Steve: You want to affect your rhythm down at the cellular level, you know, deep in your body where your biological rhythms are less superficial.

Dave: Okay. So this is something that I don't know about, the depth of alkalizing from a cellular biology perspective. This is one of those reasons that people [inaudible 00:38:25] or whatever, you look at that stuff and you're like okay, you want to be alkaline, you can be alkaline

like that. So, what's an example of a deep alkalizing chemical or supplement.

Steve: Potassium would alkalize at the cellular level. Sodium would alkalize at the blood level.

Dave: Okay, so ...

Steve: [inaudible 00:38:44] would be a deep alkalizing agent at the mitochondrial and nuclear levels.

Dave: So now I'm going to just pull out the biohacking big guns. I used to take [inaudible 00:38:54] by the way. Okay, I'm a world class athlete, I wake up at 6 in the morning and I want to tread mountains or whatever, so I'm going to wake up and I'm just going to pop a thesium capsule or take [inaudible 00:39:07] liquid which is the stuff I had, so I'm going to make myself super alkaline even though I'm in the middle of this acid phase and I'm going to chug my coffee or eat my bacon because I want to stay in ketosis and I'm going to go win. Is that going to work?

Steve: Well, if you don't overdo it. I mean, you need to have an acid momentum in the morning and you need to have acid momentum when you're initiating exercise ...

Dave: Got it. If you don't want to ...

Steve: You don't want to sledgehammer it when a ball peen hammer will work just fine.

Dave: Got it. Now you've got me wondering and so far the most effective thing I've seen for I would say 95% of the people that I've worked with [inaudible 00:39:54] I've had is bulletproof coffee in the morning. It is ... it rocks people's entire day and it's kind of mind-blowing, and I've had a few people who they don't handle the MCT very well in the morning, it gives them GI dysfunction, and a couple of people who've said I get a racing heartbeat from it, for those people that are always on thyroid meds and they always end up needing to reduce their thyroid meds because their mitochondria is working better. If someone is listening to this and they do this regular practice and they feel good on it, how

should they know how to tweak it other than if they don't want to walk about peeing on sticks for five days? Is there an obvious way to know this?

Steve: Well, no. I mean, I certainly don't know that kind of simplistic formula for it because on some level you don't know whether or not your racing heart is reminiscent of thyroid or not unless you've experience that and you say oh, that ... I know what that is because I've been there and it's not some life-threatening thing where you panic and go to the emergency room, so ...

Dave: The two people it's happened to they knew they were on thyroid meds, they said this is a thyroid problem, they backed off on the thyroid and like wow I suddenly cut my medication.

Steve: They're probably way more astute than the average person on thyroid meds because a typical person who goes to a doctor and gets a thyroid prescription, they get a dose and then 30 days later they come in and the doctor goes, you know, how are you doing and they go, no, and so okay you know ... they measure the thyroid and they're okay and they never know what hyperthyroidism feels like. They're as much in the dark as people not taking thyroid.

Dave: I have a confession to make and I'm going to tell you this because you're going to laugh at me.

Steve: (Laughs) I'll laugh at you in advance.

Dave: There we go. So about a year ago or so I tweaked my anti-aging testosterone dosage and I keep my levels in the normal levels where they should be. I'm not super-juicing or any of that weird weight-lifting stuff, you know anti-aging kind of thing and I've been doing it for 10 years and everyone knows, I'm public about it. I tweaked it with the help of a doctor and it activated my thyroid more. At the same time, I was doing a photo shoot for Creative Live, this big course I taught, and I had to hold a plank pose on the whole body vibration plate, you know, the bulletproof vibe, for five minutes so they could get the right picture. If you've never tried doing a plank pose on a whole body vibration plate

for five minutes it is an enormous metabolic load and I ended up getting basically soreness on my sternum from the vibration of the ribs in my sternum so I had chest pain ... a lot of chest pain. At the same time, my thyroid dose cranked up so I had chest pain centered on the left side and I had thyroid arrhythmia and my wife's an ER doctor and she's like, I think you should go to the ER for that. I'm like, oh man, so I'm standing there and they stuck the electrodes all over me and I'm like it was my thyroid medication. I feel like such a doofus, so thus are the dangers of biohacking.

Steve: Well, that's true and everything that you learn ... well let me put it this way, most of the lessons that are most precious that you learn are the result of a mistake.

Dave: Yeah, that's very true. Another common mistake is disaster pants. You take way too much of the MCT oil particularly, less so for the brain octane, you will really be friends with the bathroom for a little while but you also learn your tolerance for it. You learn how much to put in your coffee to feel good.

Alright, let's talk intermittent fasting. Do you use intermittent fasting, do you recommend it, what does it do for acid/alkaline and stuff like that?

Steve: I do but I don't recommend it because of the acid/alkaline thing but because natural humans, we're constantly being ... we're fasting constantly because of a lack of food availability and since we don't have that imposed upon us we have to impose it upon ourselves. They whole idea that the human animal is given to adapt to some steady state of life I think is a fiction of modern society and that when people were alive in the old days, let's pick 20,000, 50,000, 100,000 years ago, food was an iffy thing and so we were constantly going in and out of ketosis, we're constantly being aerobic and anaerobic, we'll have episodes where we're running away from a bear and climbing a tree and then other times when we'll be kicked back and partying.

Dave: Right. And so making your life more like that is beneficial because you get a hermetic change for different things ...

Steve: That's right.

Dave: I get it.

Steve: That that doesn't kill you makes you stronger, well that's not necessarily true, but that that challenges you does tend to make you stronger and therefore the more kinds of challenges you have in terms of high protein, low protein, no protein, high carb, low carb, no carb kind of things and going through autophagy when you have no protein available and all you're eating are greens that you can harvest as you're hiking through a mountain pass, those are the kind of stresses that humans would have and that every time you do that you're pinning your metabolism up against a wall and inducing an adaptive response.

Dave: Yes.

Steve: The same thing happens with pH. We have buffering systems in our blood. Our blood pH is highly constrained and so we have these two buffering systems, alkaline buffering and acid buffering, that are oriented like this which keep our blood very, very tight. Now if you are in an environment where you are eating an acid-loading diet, your alkaline buffering system is on all the time and your acid-buffering system is weak and if you've been switched to a highly alkalizing diet it switches the opposite way so the buffering systems adapt to the kind of stresses that they have to manage.

Dave: Kind of like if you only get to eat something for a while your body will adapt to digesting and eating that food and that's how it is. One of the reasons that the new bulletproof diet infographic includes the idea of a day of protein fasting is exactly that. You want autophagy, you want to shake things up. The same reason that years ago I used to try to be in ketosis all the time and not only does that suck because you don't get to eat some very delicious foods but it's actually not that good for you compared to cyclical ketosis which is where the diet evolves and that's what I'm recommending to people today and the differences they have are pretty significant.

- Steve: Um-hum and I agree and I would say that even though it's more convenient for us to pick a once a week breaking of ketosis or a twice a week breaking of ketosis, that would never be that ordered in real life and that it might even be better to say okay this week I'm going to break ketosis twice and then I'm going to go two weeks without breaking it at all. On my birthday I'm going to drink single malt and therefore I'm going to break it on that day just because I haven't had single malt in a year and so you're playing to that part of your mind that would otherwise be yammering at you, you know, go for this, and you're just giving it a day when it gets to play so that it shuts off the rest of the time.
- Dave: There is a lot to be said for that, especially in mid winter when it's cold and dark. You probably ought to be in ketosis most of the time, in summer less so and besides the peaches are ripe, like okay fine, [inaudible 00:47:16] fructose those days and get a little advanced [inaudible 00:47:18] and raise your triglycerides, yeah probably, but it was worth it, right?
- Steve: See, it's never dark in winter in my life because I have red light therapy that I do to encourage the early morning and late evening, the dusk and dawn effect, so I'm adding to that kind of effect so that I don't have the darkness issue.
- Dave: You just said red, not blue and it's kind of funny. I was reaching for my remote control. I have bright red LEDs on right now. You see the side of my face is kind of reddish, so I typically have red lights on all day, but I use this ... 1000 watts of halogen lights ...
- Steve: It's blue.
- Dave: It's like daytime so I've got blue here and the red's on until I go to bed, but it's on all day too.
- Steve: Yeah. The light spectrum does shift from red dominance in the morning to blue dominance mid day to red dominance in the evening and so I just encourage that so that the issue of the photo period adjusting around me doesn't end up giving me seasonal affective effects.

Dave: You know what, we're going to talk some more about what color light when because I still haven't even announced this yet. We're doing a double podcast with Steve today because he is just so knowledgeable. What we're going to do now, Steve, is we're going to end this episode and everyone listening go ahead and subscribe on iTunes and next one in a few days is going to be part two with Steve and he and I are going to continue talking. We're going to cover what color lights you should have when and I'm going to tell you now for 30 bucks you can get exactly this in one fixture that even looks kind of cool. It's dirt cheap, easy to do and it actually affects all kinds of systems in the body. We're going to talk about some light hacking which is why Steve is awesome. We just talked about peeing on strips, what time of day to eat your coffee or to eat breakfast, and now we're talking about lights and I'm telling you, Steven cannot only keep up with me on all of this biohacking stuff, he can run circles around me. So, you're going to hear all that, just stay tuned and come back in about 3 days when we post the next episode.

Thanks, Steve. We'll ask you the top three in the next episode.

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