

Upgrade Spotlight: Connecting Ketones, Metabolism & Energy – H.V.M.N. – #1018

Dave Asprey:

You're listening to The Human Upgrade with Dave Asprey. Today is an Upgrade Spotlight edition, and this is where I bring in someone who's built something interesting, and we get to talk with the creators and the experts behind the stuff that you hear influencers talking about and things like that. And today, I want you to know about how you can raise your ketone levels. And you might have read some of my books and I've talked about it, but it turns out there are several different ways, and this is what I'm going to call the big gun way to do it.

And our guest is a metabolic biochemist named Latt Mansor, Ph.D., and he's joining us from H.V.M.N., which stands for Health Via Modern Nutrition, but it looks more like the word human spelled with some fancy Greek thing, so H.V.M.N., and you've seen them around for years in the keto space. And Latt's an expert in elite sport, military, clinical and research organizations where he comes in to use ketones to hit levels of human performance that are not actually optimal, they're above optimal. So, I'm on a war against optimization because optimization is dumb. This is simply better than baseline. This isn't about a trade-off, this is about a new level. With no other introduction, Latt, welcome to the show.

Latt Mansor, Ph.D.:

Thank you very much.

Dave:

Now, I call you a metabolic biochemist, but you're kind of a nerd because you have a PhD in physiology, anatomy, and genetics from this little ... It's a community college called Oxford, right?

Latt:

Yeah. It's Oxford University. The thing is, the title itself, it's because of the department, and I think at some point in history, Oxford University decided to combine physiology, anatomy, and genetics department together and call it together, DPAG, Department of Physiology, Anatomy and Genetics. So yes, that's where I got my PhD from, from the University of Oxford. There are two camps of people when it comes to that, and some people say, "Oh, you should definitely tell people that you went to such a prestigious university," and then there's the other parts where they're like, "Just let your knowledge and your actions speak louder than your qualifications."

I think for biochemists and for biohacking's world, it's more around, okay, you identified in another nerd. Now, let's nerd out on a certain topic, which is what we are doing today, just talking about ketones, ketosis, what H.V.M.N. is about, what the product is about. I think that's more of a very sort of excitement for me. So, getting on podcasts, hosting our own podcast. So, I'm the host Health Via Modern Nutrition podcast as well. So, having like-minded people, even if they are on a complete opposite camp that is anti-fat and pro-glucose, and let's have a really honest conversation, intellectual conversation about science exactly.

Dave:

Well, okay. What's up with metabolism? You studied it, and you work in an applied field where you're actually taking this and saying, "Okay, you want to be an elite military operator. What can we do?" What's the state of metabolism of people today?

Latt:

I think in terms of epidemiology point of view, it's not looking very good given that almost 90% of the population is metabolically unhealthy. And we are not talking just obesity or chronic diseases. We are just talking metabolically unhealthy, being unable to process whatever substrates that you put into the body optimally.

Dave:

Okay, what's the one measure, if you could only have one, of metabolic health that you would go for?

Latt:

I think insulin resistance is a very big one.

Dave:

As measured by?

Latt:

As measured by insulin. So, either you can do oral glucose tolerance tests, or you can do insulin sensitivity tests, and also obviously clinical outputs in terms of endpoints, how well you would perform compared to an otherwise healthy human being.

Dave:

How well you perform like a VO2 max? Or what's the measure of performance?

Latt:

VO2 max over distance, time, a lot of these other performance metrics that you can measure.

Dave:

So, you're looking at cardio metabolic conditioning for some of that, and other ones you're looking at ability to clear blood sugar from the body. If a listener was going to scratch their head, they're listening to this, maybe they've tried a ketogenic diet, maybe they've tried various ways of raising ketones, but they just want to know, "How am I doing?" Would they go to the doctor and schedule a glucose test, a glucose tolerance test, or is there something you could do at home?

Latt:

So, if you are on a ketogenic diet and you are specifically looking at elevating your ketone levels, then you can certainly do that at home because there is keto meters that you can buy from Amazon, from Keto Mojo, from Abbott, you name it. And they have both glucose and ketone strips, which makes it very convenient for you to test both actually within the comfort of your home. And you'll get real-time results with a little finger prick. Now, once that back and talk about metabolically fit or metabolically healthy, then you probably have to start with a full blood panel check, blood biomarkers. That's very indicative of how metabolically fit you are. And then if obviously, like you said, you can invest more time, you can do a whole DEXA scan, you can do body fat percentage, and then you look at VO2 max, you look at all of that on top of your blood biomarkers.

But I think blood biomarkers is a very basic way to go about it, and looking at different parameters as to whether or not you're metabolically flexible, and then you go from there.

Dave:

Okay, you could order a test like that at home now, from a variety of companies. I know Knowing Labs was on a while ago, so you can get those and it's not that hard to do. But the alternate pathway, and the one that you're interested in, and the one that's the basis of the Bulletproof diet is on ketones where a metabolically fit person is fully able to metabolize fat in the form of ketones, and they're able to metabolize carbs. So, if you're someone who says, "I'm going to go keto all the time," then you become insulin resistant and you could technically say metabolically unfit. But likewise, if you say, "I only eat carbs all the time and I eat eight meals a day," you can't really get any energy from ketones because you never form them. So, then your body isn't metabolically fit either.

And an ideal state would be able to use ketones, which have metabolic benefits all by themselves, and able to use carbs, which means eating carbs at least once a week and probably more than that. I'm not on a keto diet most of the time, but I do raise my ketones exogenously, which is what you're an expert in. So, tell me several different ways people go about raising their ketones, and which ones do you think work best.

Latt:

Sure. But before that, let's talk about endogenous and exogenous ketones. What are the differences? So, endogenous ketones are essentially internally produced ketones from your liver. When people either go on a ketogenic diet, or they are doing intermittent fasting, when your body is depleted of its glycogen stores your body will start breaking down fat to produce ketones. One of the main reason why your body does that is because glucose does go to your brain and get metabolized for energy. But fats, however, because of its bigger size and molecule size, it doesn't bypass the blood-brain barrier. So, in order to supply the brain with enough substrates to produce energy when you're low on glucose, it's to break down fat into smaller molecules, and that is ketone.

So, the ketone bypasses the blood brain barrier and produce energy in the brain. So, that's endogenous ketones. Exogenous ketones have only been out maybe past 20 years or so. That is essentially supplements that you can take, which are either in a pure BHB form, which is beta-hydroxybutyrate, one of the main ketones bodies that our bodies use for energy, or in a combination of molecules, either ketone ester or in a precursor form, which is MCT. So that, for exogenous ketones, you essentially take it, you elevate your blood ketone levels acutely because you are directly pouring in ketones into your body, regardless of your glycogen levels. So, regardless whether you are on ketogenic diet or not, whether you're fasting or not, you will be able to elevate your blood ketone levels.

Dave:

You could technically just eat box of Krispy Kreme donuts and take some of the H.V.M.N. ketone product, and you're going to have ketones and you're going to have high blood sugar at the same time, right?

Latt:

Technically, yes.

Dave:

Not a good idea.

Latt:

It's not a good idea, but you could. You could have both. And I think in that sense, that's what we have seen in both research and application with military as well as athletes, where they have access to the dual sort of hybrid fuel system, where they have access with access to glucose as well as ketones. And that gives them an extra tank of energy. So, we can talk about that in a bit.

Dave:

Well, what you just said, there's probably half a chapter in my first big nutrition book about having two fuel sources in Mother Nature. If you want to run on ketones, you have to be fasting. That's the only way your body makes them. Or maybe you just only ate some fat, but that usually doesn't happen in nature. So, then you have that, but then by definition your blood sugar's low, and then you eat some fruit, or some honey, or some carbs or whatever, some potatoes, and then magically your blood sugar goes up but then your ketones drop. And since the neurons in your brain like ketones and the glial cells that kind of manage the neurons, they like blood sugar, you're always stuck with one or the other. And using any of the exogenous ketones, but there's different levels in different reasons we're going to go into that, you can magically be in this state where you have both.

And the mental performance from that is, oh my God, it's a big deal. And clearly that's why Bulletproof Coffee became 100 million dollar company because this works and it works noticeably. But that was without the big gun ketones. That was with a precursor with the MCTs. So, why would you want to use something like H.V.M.N.'s Ketone IQ? I have some stories about my uses of it, but give me the pitch. Why would you use the form you use, and what is the specific form in Ketone IQ?

Latt:

Okay, first of all the specific form is R1,3 butanediol, and we can talk about that in a bit. So R1,3 butanediol goes directly into your liver, gets converted to be beta-hydroxybutyrate. And why you do that instead of say, ketone salt, or MCT? So, ketone salt and MCT have been around for much longer. They've been around in market, people have been using them, and they do work to a certain extent. And in studies published peer reviews have shown that they do manage to increase blood BHB up to 0.5 to maximum one millimolar. And in athletic performance, for example, what we have seen is that there is this threshold around two millimolar that you need to reach before you get that advantage in performance. Now, then there is ketone ester. Ketone ester is a BHB bound with a butanediol in an ester bond. That's why it's called ketone ester. What it does is that when it enters your body, it gets cleaved in your gut and the BHB goes directly into your blood. That's why you have the big spike up to three millimolar, three to five.

And then the butanediol goes to your liver, as I said earlier, to be converted at a slow release. So, that's ketone ester. But then some research then came out and say, actually having that high of a BHB is not that good either because you are drastically decreasing the pH of your blood, IE you're increasing the acidity of your blood. So, your body is working harder to expel the extra carbon dioxide and therefore you are having higher heart rates, you are having higher breathing cadence, and that makes the perceived rate of exertion a bit higher, but without the performance advantage. So, Ketone IQ is only half of what ketone ester is, and which is in terms of molecule, which is R1,3 butanediol. And what we have found is that the curve is much lower in terms of the spike, so it doesn't go really high spike-wise, it does go slowly, and it spikes around two to three hours, and it stays on because your liver is regulating the release of BHB via the conversion of R1,3 butanediol into BHB, then your body sets the pace.

Whereas if you take ketone ester, the BHB that gets cleaved is not regulated by a liver. Only the BDO, the butanediol part is regulated by a liver. That's why you get that extra spike. So, maybe there is an ideal world where you have a spike high enough, but not too high, and then you have a slow release that lasts for hours. So, that would be the ideal product that I'm looking for.

Dave:

Okay. So, my new book that comes out shortly is called Smarter Not Harder, and I talk about this shortcut that people make cognitively, and it's to save energy. So, when we're low on energy we actually make decisions differently because we're not willing to allocate additional electricity, metabolic energy into doing the hard thinking. And this happens automatically in your meat operating system. You don't see it. But when we're making fast decisions in a low energy state, if something is good, more is better. And if something is bad, less is better. But the way biology actually works is that there's usually a Goldilocks zone in the middle. And when I started doing all this ketone stuff maybe 17 years ago, really getting into it, we didn't know the sweet spot.

And the general thought was more is better, but it's kind of obvious. Well, we know blood sugar's a good thing because if you don't have any blood sugar you'll probably die. Therefore, imagine if you had these athletes walked around going, "Dude, I found a way to crank my blood sugar up to 220. I'm winning." And yet in the keto bro world, we have people doing that saying, "My ketones are seven." Now, in my mind, well, that means your body's not using them. So, what you want to do is you want to get them up to the right level where they're providing protective benefits that ketones offer for oxidation, things like that, where they're available as an energy substrate, but they're not too high and they're not too low. And step one of this has been, okay, MCT oil, that works, but it turns out MCT oil doesn't work that well. C8 MCT oil works better, which has been the brain octane stuff that I did with Bulletproof.

And then the next level above that, which you can't get from just MCT oil, is you go up to what your new product is, the H.V.M.N., which gets you into that Goldilocks zone. And you could go for esters, but esters get it way too high because your body can't regulate it. So, esters may not be a good choice there.

Latt:

And because your body doesn't regulate it, it's dose dependent. So, the more ester you drink, the higher your blood BHB will be. So, if you are unaware of that and you keep popping in, popping up with these ketone esters, your blood BHB will get to seven, eight, even sometimes nine. So, we have seen in our military project, so we've got a six million dollar contract with DOD looking at cognitive and physical performance using ketone ester, people started to get sick. Like you said, when you were high on sugar, like when you did the OGTT, the oral glucose tolerance test, you don't feel well. That's exactly how you feel because it's like another substrate. You have an excess of energy, you have an excess of substrate, your body is trying to either use it or expel it. So in other words, you just feel ill.

So, I presented earlier last year in May in Metabolic Health Summit, I presented our results with the military. And what we have done with the military is we simulate hypoxia, which is low oxygen environment. We did it both ways. We did it one in the lab setting, where we built a hypoxic chamber and asked them to exercise in it, as well as have a shoot simulator and look at reaction time, accuracy, and all that. And then we also followed the operators up mountains with one of the units, and measured their biomarkers up there before and after baseline, and after the ketones. What we have seen, which is amazing results we saw ... And so, as you are up in 14,000, up to 20,000 feet high, your oxygen saturation at normal sea level would be about 96%, 98%, even to 100%. When you are high up there, your oxygen saturation will naturally drop. And what we have seen it drop to about 67%.

Dave:

That is go to the ER level in a normal hospital. Right?

Latt:

Right. And naturally what happens then, from an application point of view, your brain stops working. As you said, when you're low on energy you would automatically your body will prioritize survivability. It will not prioritize efficiency, it will not prioritize optimization, it will prioritize whatever that you need to survive at this moment, that will do. But people who have taken ketones, their oxygen saturation was up about 7% from 67%, so about 72%, 73%. And that is reflected with their improvement in cognition. So, they have better reaction time, they have faster and more accurate cognitive performance.

Dave:

There's something else going on there. Their blood oxygen is higher, but ketones have more electrons than glucose, which means that even if there's less oxygen, when you take less precious oxygen at those high altitudes and you combine them with ketones, you're getting extra electrons. So, it's not just a 7% improvement. I don't know why blood oxygen's higher in those people, but I do know that if you take whatever oxygen you have and you combine it with the ketone, you get several more electrons than you would get from glucose, which is why in those extreme performance environments they perform better. But what about the rest of us sitting here doing a podcast? So, I did take my Ketone IQ this morning, but what cognition improvements do we see at normal altitudes?

Latt:

So, first of all, to address what you just said on the oxygen efficiency, and you're right. In 1995, Sato published paper that looked at the efficiency of glucose versus ketones being metabolized per molecule of oxygen. And it turns out that ketone is a more efficient substrate, essentially, per molecule of oxygen. So, let's get that clear. And then in terms of people who are not in extreme sports, who are not pushing their bodies to the limit, what are the advantage of using Ketone IQ? If you look at Mujica-Parodi's paper, I believe in 2021, they looked at the brain network stability in aging adults. So, essentially the interaction between brain regions. And they tried it with a week of ketogenic diet, and then another arm with one dose of ketones.

And what they have seen is that both group showed an improvement in brain network stability. So, in other words they showed an improved communication between brain regions, which is normally destabilized as we age. So, from that perspective, as well as knowing that ketones are being preferred in terms of a fuel substrate by the brain and by the heart especially, it's a powerful tool to essentially provide your brain with the energy it needs. Now, here's the kick though. A lot of people think, "Oh, it's brain energy so I shouldn't take it before bed, or I shouldn't take it close to at nighttime." It is a brain energy substrate. It's not a stimulant. So, I try to explain to a lot of people where caffeine, for example, is a stimulant. It directly excites your brain and it increases the demand of energy because it's increased in brain activity, therefore increasing brain energy demand.

Ketones, on the other hand, it works completely different because it actually provides the brain with energy without stimulating.

Dave:

Okay. My brain does work better when I have ketones and caffeine, and a little bit of nicotine, and some other mitochondrial stimulants all stacked together. And it's just so easy to drop into a flow state. It's much easier than if you say are eating normal carbs, even sweet potatoes and the stuff that are good.

And I actually do eat carbs when I'm doing that. So, I'm not doing it in a fasting state usually, but sometimes I am. But what I will do is I'll make sure I have some ketones. And the Ketone IQ works phenomenally well. And I do sometimes stack it with MCT oil, because I tend to have MCT every day. I use it as an oil when I'm preparing stuff, I sprinkle it on a salad or something. But it's kind of a background level of ketones, and it's nothing like the kick you get from Ketone IQ. So, I think you can almost say it's a nootropic, although it's a metabolic nootropic.

And my book, Headstrong, was all about two things. It was BDNF, which increases neuroplasticity, and having mitochondria that work in your brain. And when you do that, like oh my God, I didn't know I could do this. And it's interesting though, because the way of getting your ketones higher than you can with MCTs are fasting, which is what you're doing with Ketone IQ, but not too high, which would happen with an ester, that's a new innovation in the field of ketones.

Latt:

It's interesting you mentioned BDNF and mitochondria as well, because-

Dave:

I knew you were going to go here. Yay.

Latt:

... ketones have shown to be anti-inflammatory. So it creates, or it sort of helps mitochondria create more antioxidant. And I think Dr. Gundry talked a bit about this, about the uncoupling that increases when you have higher ketone levels. But if you talk about mitohormesis, which is an appropriate increase in uncoupling in the mitochondria, actually creates oxidative stress, but just enough, like you said, in the Goldilocks zone that the mitochondria feels that it needs to provide more antioxidant and that's how you create more antioxidant. And then BDNF, earlier, a few months ago, three months ago, I interviewed Dr. Louisa Nicola from New York, a neurophysiologist, and she talked about increased resistance exercise actually increases BDNF and increases the size of hippocampus, which is the region of the brain that dictates learning and memory.

And then another paper came out, or I found another paper after that, that looked at what exactly during exercise that increases BDNF. And they actually manage to prove that it's actually an increase in ketone levels when you exercise, that directly increases BDNF.

Dave:

That is a really big thing. So, longtime listeners know BDNF brain-derived neurotrophic factor, this is what gives you the neuroplasticity of a young brain. It's easier to learn in your early 20s or even in your teens than it is later in life, unless you're managing your BDNF levels, which you do some polyphenols, you do all the different things. Even some of the exercise, and sleep, and cold exposure, all the biohacks that have been on the list for a long time, most of them have a BDNF edge, but most of them also have a mitochondria edge. So, there's a cool dance between raising ketones and having a flexible brain.

And with Ketone IQ, what we're getting is the ability to turn that up even more without going over. So, I am intrigued, because like I said before the ketones esters were a bit much, and I hated it. I mean, I could focus but it was like this ampy, edgy, uncomfortable feeling, and that's what ketone esters feel like to me. It felt like too much. But when I do Ketone IQ, I just feel more dialed in and it's very noticeable.

Latt:

It's a very subtle energy increase.

Dave:

Yeah. Talk to me about fasting and Ketone IQ.

Latt:

Recently, actually last month, I did a 48-hour fast. It was my longest fast ever because I normally don't do fasting, and I thought I'll just try it with Ketone IQ. And it was much easier than I thought much.

Dave:

It's effortless.

Latt:

Much easier. Yeah, because it really helps with the energy level because it provides you with energy. It does have 70 calories per shot. So, if you're fasting for autophagy, some people may argue that might break it or prolong the time you need to get into autophagy, but at the end of the day 70 calories versus your normal daily energy expenditure would be nothing.

Dave:

You mentioned that elevating ketones, especially ketones using what you guys would have as the Ketone 1.0, the old version of what you did before you came out with this new Ketone IQ, which is your second, we'll call it second edition or second generation of drinkable ketones. The first generation we know spiked acid a lot, and affected your metabolism negatively. What about your Ketone IQ, the second generation?

Latt:

Ketone IQ, I don't believe there's a study that looks specifically at pH yet, but what I can say is that we just completed a study with University of North Georgia that looked at anaerobic exercise. Now, never before has it been done in the exercise world looking at exogenous ketones and anaerobic, because it's all in endurance, all in cyclists, and all this.

Dave:

And you're looking at strength and power output, right?

Latt:

We're looking at power output, and we're looking at fatigue, and the results are super interesting. We are in the process of writing the manuscript so I can't share too much, but we are seeing an improvement anaerobic and power output all across board, as well as lower fatigue. Now, that is interesting. It could be something to do with the substrate metabolism level, but it could also to do with the brain cognition and the perceived pain when you push yourself that hard. So, that is super interesting.

Dave:

Will you come back on when you have that study and talk about it?

Latt:

Absolutely, absolutely. We are planning to submit in February, so it's with Dr. Parker Hyde who got his PhD from Jeff Volek, actually. So, small world and Jeff Volek is very known for ketogenic diet and all of that related to health. So, hopefully we'll get the publication out sometime end of Q1, if not Q2, but as soon as we submit in February then we can suddenly talk about it already. So, happy to talk about the results.

Dave:

The data that I found showed, and hopefully this isn't already in your secret study, but athletes who drank ketones full recovery and sleep over a three-week period had a 15% increase in power output.

Latt:

That's correct. That is Peter Haspel's paper look at cyclists, and they look at using ketones together with carbs and protein as a post-exercise interventional strategy, and they saw an improvement in power output.

Dave:

15% improvement over three weeks is fucking nuts. Those are scientific terms, but holy crap. So, I will just say, and we have a lot of professional athletes who listen to this show, probably Nick Foles is hearing this. He mentions my work several times in his book. Thanks Nick, if you're listening, he's been on the show too. And guys like that who have a chance of hitting their head, MMA athletes, you are nuts to go on a field without having your ketone levels elevated, and Ketone IQ is going to get them higher than you can with the other ways. And it's higher to the right level anyway. And the reason for that too, is that if you hit your head and you have high ketone levels, you won't get the brain inflammation to the same extent as if you don't have ketones. They're neuroprotective in the case of traumatic brain injury. So, if you're in a high-risk sport for that, you should have them. And the other question for you is, how soon after you drink Ketone IQ do your keto levels elevate?

Latt:

The answer is simple. You can see it within minutes. So, if you measure your blood ketones within half an hour, or even 20 minutes, you will see an elevation blood ketones, and it will continuously rise up to two to three hours. And that's why we like Ketone IQ more than ketone ester. So, as you said, we came out with 1.0, which was ketones ester. We brought exogenous ketones minus MCT, minus salts, we brought the first ketone ester into the world, but we switched it to Ketone IQ, one, because of the price, obviously. We want to make it more accessible for people, everyday people who are not athletes, who are not doing it just for marathons or races. Two, is the taste, as you said. We found that the ketone esters are much harder to improve in taste because one of the tasks with the military was to improve the task.

And we worked with Monell Research Center, which is a sensory expert in sensory as well as taste flavor, R&D, they literally tried everything. Dairy, artificial sweeteners, natural sweeteners, none of them work. In fact, ketones esters suppressed the sweeteners from these sweetness, which is crazy.

Dave:

I have to say one of the reasons that ketone esters never raised my interest that much, aside from not feeling great when I did it, you have to really ... It's almost like getting in a cold tub, you kind of take a

few breaths before you go in and it's going to be a shock. That's the taste of ketone esters. It doesn't matter what you do. They taste like I'd rather eat raw liver, which is also gross.

Latt:

It's really a hit.

Dave:

Yeah, the Ketone IQ, you just take a shot of it and like, oh, it's kind of neutral. It's not a bad thing, and it's very easy to do that. But you have to sort of have a giant beard and large muscles, and some self-hatred to drink ketone esters. They are so bad. You have to man yourself up to do it. Ketone IQ is-

Latt:

Yeah, I have to actually prepare myself.

Dave:

Yeah, completely. It's like a meditative act of like, okay-

Latt:

It is. It's like I open a bottle and I'll take a few seconds to mentally prepare myself before I down it. And that was like three years ago. And the third, and the last reason why we switched to Ketone IQ is efficacy. So, as we were talking about the science, it does, like ketone ester, it increases your blood BHB to a very high level at a very short amount of time, but it also crashes down quite quickly afterwards, especially if you are exercising. What we found in Ketone IQ is that it stays quite stable in the blood for up to six hours. Now, for people who are using it for therapeutic users, for cognitive users who are not exercising, they are at rest, that provides the longest benefit in the most optimal Goldilocks zone. And that comes back to your question around TBI. We actually have an active grant that is in application at the moment, active grant application with the Naval Health Research Center, because obviously the military has a high risk of getting TBI.

And we are proposing using Ketone IQ, not as a mitigative yet because the mitigative study would take a lot, especially if we want to get it into the hands of high-risk people, and travel and all that, the cost will get tremendous. We want to get it as a proof of concept first. So, we are looking for mid to long-term people, mid to long-term TBI patients who have had difficulties in terms of either cognition, eye coordination, motor sensors problem, then we're going to give them Ketone IQ and look at the improvement that we're going to get. And then with that, we're going to bring it back to the military and say, "Hey look, if this can help people with mid to long term damage, think about the mitigative effect you can get with people who just got TBI acutely and you're providing it with ketones.

First of all, you get the neuroprotective effect. Second of all, acutely we have seen a hypermetabolism of glucose and TBI patients, which means your brain is pulling in all the glucose either for energy to mitigate the damage, or pulling it into the pentose phosphate pathway, which is also for recovery from the damage. But either way, your brain is taking in all these substrates, and you are having an energy deficiency here. Providing ketones, you are providing a different group, a category of substrate to face that deficiency and face that demand. And then long term, these patients also develop hypometabolism of glucose, which in a form of either insulin resistance or very similar effect to Alzheimer's and cognitive impairment, where your brain is inefficient in metabolizing glucose and provide energy. And as an effect of that, your brain going to work less efficiently.

So again, ketones providing the brain energy that you need in that hypometabolism condition, providing that, fitting in that gap of energy deficiency would be quite essential to really make sure that your brain works optimally. So, exciting area, for sure. TBI brain damage and ketones.

Dave:

You probably aren't allowed to say this, but I am. We have enough evidence now to say that if you're doing a sport that requires you to wear a helmet, you should have an internal helmet, which would be having elevated ketone levels, and Ketone IQ is an ideal way to do that. So, you could literally make yourself less likely to have long-term effects from a TBI should you hit your head. Also, we can say right now, given any other evidence to the contrary, it seems very likely that if you hit your head, as soon as possible have a couple doses of Ketone IQ. And so, since athletes are required to stick to limited things, you actually meet the bar for, okay, it's a performance enhancer that's allowed. So I'm like, "Why would you not do this if you're a pro athlete?" The 15% power output improvement, it's a big deal, and it stacks with the Bulletproof diet, it stacks with carnivore, it stacks with a vegan diet, it doesn't matter.

You can eat whatever you want. And this is just additional benefits. It's also about two-thirds less expensive than your 1.0 product, right?

Latt:

Yeah, absolutely.

Dave:

Okay. And it tastes better. So, the taste is okay, the price is okay. The performance is better than your 1.0 product. And so, I'm a fan. Oh, I should mention this too. Every time I fly I take one or two shots, especially for those long distance transcontinental things. You feel so much better when you land. I mean, it's a massive difference.

Latt:

And again, it comes back to the hypoxia when you're at high altitude, and it gives you energy. And what we just discussed, we can just summarize. One, it helps with the energy demand and deficiency in the brain. Two, it helps with anti-inflammatory. And three, it helps with ischemia and hypoxia. So, when you have that damage you have that constriction of blood vessels that causes ischemia, which is lack of blood flow, or hypoxia, which is low oxygen environment. It does help in those conditions. And research have shown ketones role in ischemia, specifically in the brain and in the heart, they show a mitigative effect and a protective effect that is caused by the molecule.

Dave:

Okay, so there you go. If you're flying, you should be on Ketone IQ. If you're fasting, you should be on Ketone IQ. If you're exercising, especially at a high level, you should be on Ketone IQ. Should people take it before bed?

Latt:

You know what? We've got mixed reviews in terms of taking before bed, because some people find that they have more vivid dreams before bed. I personally take it before bed. I like it. I do feel like I sleep better. And a lot of my friends, they take it because they feel like they sleep better. Some people, they just don't like the vivid dreams. It's a preference, I would say. But certainly if you want to take it for

recovery, take it with your protein shake, whatever gold standard recovery drink that you're taking on top of that. Don't mix it together, obviously, because that might make it taste a bit weird. But have a shot-

Dave:

Just take a shot and drink your recovery drink.

Latt:

Exactly. And talking about water as well. So, every batch and every lot that we produce, we do send it out to a third-party banned substance use lab to check all the substance as well. And for athletes who are listening, just email us. We'll send you the report for that specific lot. And in terms of traveling with it, we've got those little single shots now, two ounces, 10 grams of R1,3 butanediol, which is TSA pre-check ... Sorry, TSA approved. No problem.

Dave:

Yeah, that's what I do. I take usually about three of those with me for a longer flight, and I'll just spread them out throughout the flight, even though there's a six-hour life so I probably don't need more than two. And guys, you know anytime someone comes on to talk about their company's things, I always get you a discount. You just go to <https://H.V.M.N..com/DAVE>, code Dave, 20% off. And I'm serious about this. It's very noticeable the first time you try it. And there's a ton of really solid research for a whole variety of benefits because a lot of the biohacking stuff that I've been teaching, it's about foundational things. And this is foundational because when your mitochondria work better, when you have less inflammation, well, it affects everything. It affects cognition, it affects muscle output, it affects even levels of happiness. And I don't think you have any studies on dopamine signaling, but I'll bet you that when your mitochondria work better, your dopamine receptors work better too.

I have no data for that. It just feels like that. So, I just feel like if you're struggling with fasting, you're struggling with weight loss and things like that, if you can take some Ketone IQ and then you just don't think about food because you have enough energy, wow, maybe life would be better. You're not supposed to suffer and struggle to improve your performance and your cognition. You can if you need to, but let's minimize that and maximize the benefits. I think this is a foundational technology for biohacking, and that's why you're on the show, and I appreciate you.

Latt:

No, and let's not forget as well, if you are doing something to improve health, and if you're suffering, clearly that is not sustainable. You want to do something that's sustainable and consistent in order to have a long lasting effect, because as we know our bodies adapt. And only when you do it enough times for a long period of time that it can adapt to the new norm and the new me. And as we're talking new year here, new year, new me. So, there you go.

Dave:

Thank you for saying that. It's almost like you could have written the forward for Smarter Not Harder. And by the way, guys, if you support this show, you support my work, please pre-order Smarter Not Harder, just as little token to say thanks for all the free stuff. It matters that people order it now. But the idea thereof, oh, I'm going to do something that sucks every single day for the rest of my life, it just requires too much willpower. What if you could do something that didn't suck, that worked better?

That's the smarter, not harder idea. Because now we know. We didn't know about Ketone IQ three years ago.

We didn't know about it 10 years ago. So, it's just a brand-new thing that works better than the old way. And the lower in your foundation you can improve yourself, the more upper benefits you see. And that's why you should go to <https://H.V.M.N..com/DAVE>, code Dave. I want you guys to try this one time and see what I'm talking about. Maybe you'll take it every day. Maybe you'll take it before you hit your head. Maybe you'll just take it when you fly. But it's a very meaningful tool, and it's actually affordable compared to where it was a couple years ago. And it works better, and it doesn't create that ester ick feeling that I did get before. So, thank you for making something cool and new. And thanks for just burying yourself in all the research, Latt, it's awesome to have you on the show now.

Latt:

No, thank you for having me.

Dave:

If you liked this show, if you learned something new, you know what to do. There's two things I want you to do. One, go get Smarter Not Harder. It's my new book. Pre-order it. It's so helpful if you do that. I can't state enough how important it is to have all the orders at one time for the first week. So, if you're going to read the book anyway, I recorded it for you on Audible, just please support my work by picking up the book. It is worth your time and energy. And when you're reading it so that you remember it all, pick up some Ketone IQ. <https://H.V.M.N..com/DAVE>, code Dave. It works.