

Dr. Mike T Nelson

Hey, what's going on? It's Dr. Mike T Nelson here back again with the Flex Diet podcast. And today I'm doing an ask me anything. I posted up some questions to Facebook and Instagram. I'll be covering a few of those here today.

If you enjoy this format and want to see more of it, drop me a line, let me know. Also drop me a line, let me know what questions you would like me to answer.

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All right, then next question, actually the first question for this episode here. Question NAD plus and resveratrol as a supplements highly appraised by Dr. David Sinclair considering longevity and aging, but what is your take on them? That's a good question.

Thank you to Selena or Cecilia, hopefully I pronounced your name correctly. If not, please drop me a note and let me know. If we back up a little bit. Why would people be interested in different NAD plus supplements? So the main two there's, well, there's kind of three ways. So three ways. You can increase NAD plus, which is an intermediate and energy pathway processes. I'm not going to bore the crap out of you with way too much biochemistry. I'll put a bunch of studies here.

One of them's got a really nice overview of that you can read those for more information. As a supplement in the sports field. There's two main ways one is an AR, like attend to mind right beside the other one is an m n. Nick attend to mind mono nucleotide. So via oral consumption of supplements. Those are the two main ways that will increase your body's production of NAD or NAD Plus, I'll probably just refer to it here as any D, you can potentially do an IV of NAD plus also, I have not done that.

I've heard that it can be quite painful, as a little bit more time consuming, and generally is pretty expensive. I've looked around that just hope somebody's at our door here, I guess. But I've looked around at what the cost of an IV would be.

And it's several \$100 to potentially several \$1,000. So pretty expensive. There isn't much data on the IV version right now. I know some people in clinics for TBI or concussions might use it. And anecdotally, I've had some friends who have done that. And they have reported that after several series, it was beneficial. So anecdotally, a lot of the data that's been reported is beneficial.

Again, there's you know, placebo involved and a bunch of other stuff. And there's just not much data that I can find on that. So we'll probably set that one aside for now. So the two main forms and the supplements, which you can buy over the counter currently, as of this recording, like I mentioned is nR

and Nm and they both show up in the pathway to increase NAD plus the data on them is I would say relatively split. So I've gone back and forth on this.

Right now my bias is more towards nr or nicotinamide right beside reason for that is as far as I can tell, it has more data, especially in humans. Both of them surprisingly have a fair amount of data in the sports supplement world.

Shockingly, you don't need a lot of data per se. And the catch 22 in the industry is you can spend money too. do a trial, which everyone says yes, that's what you should do. The downside is how know if it really drives sales. I know of a buddy of mine who ran a supplement company, he doesn't anymore. They spent a quarter of a million dollars on a study, which was done in humans.

And their thought process was, hey, you were doing all the good things were running studies are showing that this is going to be efficacious, they did show a benefit to it. They didn't really see any uptick in their sales. And you've got other companies, that's been absolutely no money on research, maybe even potentially questionable.

We'll say production, facilities, testing, etc. But if they've got really good marketing, they can still move a lot of product. Again, this is all ethics aside. So that's kind of the catch 22 In the sports supplement realm, in our itself, is the raw material you can get from chromadex, which is a large company. And to their credit, they have sponsored a lot of studies on and our raw, there are other studies on nm men, from what I've heard, anecdotally, from my friends in the supplement world is, the raw material of ena men appears to be a lot more suspect, just people who have done off the shelf testing. Again, this is unpublished data.

And because nn is becoming more popular, now, the raw material itself is still relatively expensive. That generally has an incentive, unfortunately, in the wrong direction for some companies to say, Hey, this is an a min, and we just stuck it in the bottle in who's gonna know unfortunately. Now, again, that's not technically legal either.

According to the FDA, what you put on the label has to obviously be in the bottle. But some companies just bank on the fact that they're not going to get tested and not going to get caught. So again, as always, buyer beware, do your research, do your homework, write to the company, ask them, have they done any studies on it? Now, you can also ask them for something called a COA, certificate of analysis, does that 100% Absolutely. give you confidence that it is legit material.

Unfortunately, not necessarily, because I've heard of companies just fraudulently producing COAs. But do your homework. Most companies in the supplement world that are doing things by the book are going to need more than happy to explain to you what they do, what facilities they manufacture from, what their QC processes, quality control, how do they test, incoming raw material, etc.

Because all of those things are expensive. And they want to show that they're doing things by the book, because they want to sell more products in an ethical way. And like I said, that does cost more money.

So if consumers start demanding higher quality product, and that will hopefully drive out some of the shady practices that unfortunately are still going on.

So back to nr versus Nn. My bias right now is towards nr because there's more studies on it is easier to verify the raw material via chrome index. So they do sell a version, which they have not paid me anything to do this podcast or no monetary from them, I did get a couple of free samples from them at the current ISSN conference, which was very nice. But you can find their material online and that goes under the name chromadex is the manufacturer.

Again, they do have a license and you will find other companies that are selling it as nr and and then is a little bit trickier. Which I think is why it's harder to ensure the raw material is exactly what they say it is. Both of them have some very interesting data and mice and petri dishes and earthworms and other little critters. But nr as far as I can tell has more safety data. So in terms of nr What are you looking at for potential dose? So they did a study this was I think Trumbo TRAMME I LL, I'll put a link to it here, where they looked at both healthy human volunteers and mice.

They did a dose of nr at 1000 milligrams twice. per day. So that was 2000 milligrams or two grams. And they did show that it could increase steady state whole body levels of NAD plus up to about 2.7 fold after one dose. They did a very nice end of one experiment with lots of sub analysis. Again, I'll link to all of this. And then they also did conducted a controlled experiment with 12. healthy men and women looking at three single doses event are on blood and urine Na plus metabolites.

That one was published in Nature communication 2016. Since then, they do have three other studies that did demonstrate NAD plus in terms of increasing it via nr, using that true nitrogen product, doses as high as 2000 milligrams per day. And the longest study in humans was 12 weeks.

So one of the reasons I'm hedging my bets a little bit more towards nr, is that they do have as far as I can tell more safety data in humans, because the first question if you're using any new supplement, is it safe, right, so you're looking at the potential upside, versus the potential downside. Now, again, you could argue, hey, that's only like, really for studies, which in the grand scheme of things is still relatively low, which I would agree with. So we don't have an absolute ton of safety data.

I haven't been able to find as much safety data that's been published again, maybe it's out there. I didn't do you know, hours and hours of research on it, but appears and then has a little bit less data in terms of safety, but haven't really seen any case reports or haven't seen anything negative that's been published?

Again, the question asks, if you talk to researchers like David Sinclair, his bias is that it appears to be safe. And again, he has access to because his lab is studying and then much more data that is not going to be currently published yet.

So maybe we will have a lot more data coming. It's just not published yet. In terms of efficacy, we have to segregate between healthy people versus non Healthy People pathologies. A lot of the studies of nr or clinical studies that are going on now are in pathologies, something's wrong we're trying to fix it, you

will see very different results on that versus does it just increase energy and healthy people? My guess is we'll find that either in a man or an AR may be beneficial for different types of pathologies. There's some pretty good underlying data that does support it.

But again, there is a general lack of clinical studies in humans. If you look up, there is a whole bunch of clinical studies that are going on right now. Some of the bigger ones, according to the FDA website should wrap up 2022 2023. So hopefully, we will find more safety data and efficacy data coming down the line. So one of them I'm looking for to be published, hopefully soon. I don't know what the status of this it says the last update was published January 19 2022, effects of vitamin B three derivatives, nicotine in mind riboside And are in bone, skeletal muscle and metabolic functions in aging.

Now, this study is a clinical study that's ongoing in healthy elderly individuals. So again, hopefully, we will have more information on that coming out. One side note in terms of dose, the dosage right now I think, is probably relatively low. So if you read online, a lot of it will be you know, for nr, and a man's gonna be different men are, you know, 300 to 500 milligrams per day.

Some of the studies have been looking at 1000 milligrams per day, or even up to 2000 milligrams per day. Now, again, that does potentially get cost prohibitive. The raw materials on both of them are still quite expensive. In terms of ergogenic data. Again, I am waiting for ergogenic data, so data to show that it increases performance. If NAD is a limiter in the energy pathway, then nr or no man can increase that pathway.

We would expect that it would show an ergogenic or performance enhancing benefit during exercise. I don't know of any data in humans on either compound that's been published looking at that. I also don't know of any athletes that are using that paradoxical Li, maybe they're not aware of it, or maybe they've tried it and didn't see any benefit. Who knows.

But usually high level athletes will be trying all sorts of things. Whether that's the most healthy thing or not, that's a side question. I haven't anecdotally heard of anyone using it or seeing big benefits. I've heard some anecdotal reports of people using it as an IV, so NAD pluses and IV and an increase in performance, but I haven't seen even an n of one data on that. So yeah, maybe was this perception? Maybe they felt better. Who knows?

Though, right now, not much data on that, again, you can look at my podcast from the ISSN. There was a great talk there. And then the presenter was also arguing the same thing that we need more data on nr or n mn, to see does it actually increase performance. So if you're a grad student, or a PhD student out there, or a lab looking for something to do, to me, I think this would be a relatively cool and air quotes easy study to do.

Both compounds are in the sports supplement realm, at least that then are we've got a fair amount of safety data. So IRB approval shouldn't really be much of an issue. You could use different methods, like a time trial to look at, does it enhance performance or not in a healthy population, most of the time, you can get grad students and other healthy college students to be recruited into the study, you could do it as a single dose. And then also as an ongoing study, I don't think a single dose is going to do

much in terms of exercise performance. But a higher dose over many, many weeks, might we don't have any data on that.

To sum up, not a ton of data on either one. I'm hedging my bets a little bit more towards nr, because we have more human safety data on it. Again, maybe there is more on Nm. It's just not been published yet, or I haven't found it. If you find it, please send it to me. I'll link to a whole bunch of studies here where you can read more up on it.

Personally, I'm going to try or I have been trying as this recording a higher dose of nr, using 1000 to 2000 milligrams per day. Right now I'm on week six, I just started. And I'll be measuring performance and heart rate and heart rate variability, there'll be an end of one, it's going to not be quote unquote, a perfect study. But just seeing does there any effects that I can detect? Usual things measuring sleep by aura, etc. Um, so far, I can't say I've noticed anything different.

The last four days, HRV has been trending up a little bit more. Again, that could just be from other factors. So it'll be interesting to see, at the end of the study, I'm probably going to do it for another six weeks, which would put me right at the 12 weeks, which is where we have human safety data so far. And I'll report via the newsletter if I find anything.

So if anyone else has any anecdotal data they want to report, let me know or post up below on social media once this podcast is out. Thank you so much for the question. And the circle back again, in terms of resveratrol. Man, I have even less data on that. Again, if you listen to people like Dr. David Sinclair, his argument is that you probably need some fat for resveratrol to be absorbed, dosage are probably going to be on the higher side.

From what I've determined just looking at some of the literature, it's really split. So I don't know on that I haven't played around with it. I've used it for just a couple of weeks, again, didn't notice anything with that. Anecdotal, no one, probably under dosed and probably for too short of a duration. So there is some theoretical support for it in terms of underlying mechanisms. Will it make a huge difference? I don't know. That's, that's my thought right now. So thank you so much for the question. Really appreciate it asked me anything.

Question number two.

What was your favorite Slayer segway of all time. This was from Andrew Bailey. But for those who don't know, I did my masters at Michigan Tech University. I actually did two years of postgraduate work there. And then my master's was another two and a half years looking at primarily it was in the area of biomechanics was all my coursework and then looking at heat transfer was more the project that I did. And so while I was there, one of the top Three reasons I went there was, at the time, this was back in the late 90s, which means I'm old.

They had one of the top mechanical engineering programs in the US think in terms of ranking. And just total people in the program was top 10. Top five. They had a ski hill, which was great. It's in the up in Michigan. So the Upper Peninsula, Derry, and they get lots of snow. So I was started snowboarding in

1992. So I did ski patrol for snowboarding there, which was pretty fun, taught snowboarding lessons for a while, actually got to teach snowboarding lessons, there's, for gym PE credit, I was one of the instructors for that I was pretty fun.

And then they had a weight room, which was very nice and the bottom of one of the dormitories that you could sign up for free. And it was like \$25 A quarter. And they had a radio station next to it. So college radio station, you could apply to have your own radio show. So for four plus years, I did a show called metal madness on Monday nights, from 10pm to 1am.

And I was also the for four years, the director of loud rock music there. So I was in charge of talking to all the record labels getting CDs, and that time tells you about how old it was keeping track of the music that was played charting, etc. One of the things I did on the radio show was I would have whatever like was one of the more poppy type songs, the middle of a block of metal, I would just start playing that. And then I would fade Slayer into it.

Which I stole that from a previous DJ who I can't even remember right now. So I'd say probably my favorite of all time was Britney Spears was super popular at that time. So I think that was one of my favorite ones. So I note on that which was very interesting. We used to drive down to the Twin Cities, especially first avenue for a lot of metal shows. The drive would be seven and a half hours. Typically. I remember we drove down once to see Cradle of Filth, which was awesome. Got to meet Danny, the bass player.

I'd met him a couple of years earlier at the Old Milwaukee Metal Fest. And so he was doing his impersonation of Britney Spears during the warm up before they went on stage because she was playing that night literally across the street at the target center. So to hear His voice, do impersonations of Britney Spears was pretty interesting to say the least.

So that was probably one of my favorite ones of all time. I do miss doing the radio show. I've thought about doing it as a podcast again for many years. Downside is I can't figure out how you get around copyright issues. Even if you have all the music per se. Most platforms right now are very strict on it. But yet, I know people have put out stuff on YouTube.

And that seems to be okay. So I don't know if anyone has any ideas of how to get around that let me know. I'm not looking to steal any artists material or anything, but just trying to help them out and distribute more cool music to people. So thank you so much for the question.

Next question here on the Ask Me Anything is from Nate Hadd, how can I increase my HRV. Any suggestions on supplements and lifestyle changes types of exercise? Any insight would be great.

So HRV is a overview for people who may not be familiar with it. HRV is equal to heart rate variability, if your heart rate is beating like a metronome, so right on the beat all the time, that's actually not a good thing. There should be some fine scale variability in your heart rate when measured at rest. So if I was to record your heart rate at rest, when you're listening to this, let's say it's 69.7 71.2 70.3 69.7 71.2.

It's going to oscillate a little bit around an average point. So the more of this fine scale oscillation or fine scale variability, the more heart rate variability you have, and in general, that's considered a good thing. That's actually a marker for para, sympathetic tone. So heart rate variability as a way to monitor the level of stress via the status of your autonomic nervous system.

So your autonomic nervous system is composed of two components. One is the Para sympathetic side, this is like the brake on your car. As you push harder on the brake, you've increased something called vagal tone, heart rate goes down, right, so you're stepping on the brake of the car and the car is going to slow down. This increases what's called parasympathetic tone, I'm increasing how hard I'm pressing on the brake, therefore, the car is slowing down. So we higher parasympathetic tone will result in a lower heart rate. The other side is the sympathetic side.

This is like pressing down on the gas pedal of the car. As I lose fine scale variability, my heart becomes more like a metronome. I'm increasing sympathetic tone. So I am pressing down harder on the gas pedal. And heart rate will then go up, though, if you measure the status of your heart rate variability, I've been doing this in clients now for Ooh, man, going on eight years, I think, pretty much since the I fleet app came out. So instead of athlete it's I fleet with an eye. So that is the app I still use to this day to measure it.

There's some good studies to support it. Simon CEO is a good buddy. And the nice part is that you can measure it now daily. So one off measurement, probably not that useful. But if you've got a trend over a couple of weeks, very useful, that's telling you how much stress your nervous system is under. Side note on that, with the I fleet system, you want to take a measurement once in the morning. For most people, this is going to be in a seated position.

And then below that you can enter in different contexts. So self report of energy, exercise, intensity, sleep, etc. And as per then, as I have a measure of resting heart rate, because we'll get that from the app, also, I have a measure of Heart Rate Variability takes about 60 seconds. So I know the status of their nervous system, how stressed they are. And I also have the context indicators to just kind of get an idea of what's going on with that particular client or athlete. So I find heart rate variability to be super useful.

Again, I'm biased because my research that I did for my PhD, was in metabolic flexibility and also heart rate variability. Back in the day, we measured it via coming in to the lab, we had some used equipment that cost us several \$1,000. And I actually had to write a silly MATLAB program to transcribe it, and turn it in by hand and do a finished program called coop vos, which is open access. And it was a real big pain in the butt.

You just had to come into the lab in order to get the measurements. Now they're sticking HRV into like every device known to man, I would make sure that what you're looking at for HRV is a valid measurement. I just got another question on this this morning. So write to the company see what verification data they have on it. Because HRV is becoming more sexy now.

And there's some good ways to measure it. But I don't really trust it in a lot of consumer devices yet. I know they'll probably get better over time. But caveat, watch out. So back to the question from Nate.

Any suggestions on supplements, lifestyle and types of exercise would be great. So I'll categorize these in to supplement lifestyle changes and types of exercise.

Number One On The List would be increasing your aerobic base. I'll probably have another question in the AMA series at some point about aerobic training too. But aerobic training is your metabolism's way of using oxygen to create energy commonly in the lab, or there's other markers you can do to measure this is something called VO_2 max.

So VO_2 is the volume of oxygen and maximum rate your body can use if we put you on a rover or treadmill or a bike and we use something called a metabolic cart that can measure how much air is coming in and air is going out. And it's looking at oxygen and CO_2 levels during exercise. When we see that despite increasing exercise intensity, your body will reach a plateau of maximal oxygen use. So this by definition then is your VO_2 max. So for aerobic athletes endurance athletes, this is sort of the equivalent to their one rep max.

For a strength athlete, VO_2 Max is not the be all end all for prediction of endurance athletes, but it is one of the factors and is the best way to measure your aerobic base. Now if you're not a complete nerd like I am, I actually have a metabolic cart here. Shout out to the PNP people, if you have any questions on that, you can email me, I also have a Moxie set up, which lets you look at muscle oxygenation levels that little local level also.

So we'll stick them on their quads are the working muscle. So I can see systemic changes in flow rates, how much air is going in and out, changes in oxygen changes in carbon dioxide. And I can also look at on a muscle level, how much oxygen is being used at that particular local level. Again, you probably don't need all of that it's pretty expensive.

It's several \$1,000. You can do a 2000 meter test on a concept to rower so go to the concept two site, just type in VO_2 Max calculator concept two, it'll pop up. When you get to your concept two rower, set it for exactly 2000 meters and row as hard as you can, it will not be much fun at all, it will definitely suck. But then you can plug in that time into the online calculator.

And they'll give you a rough estimate of your VO_2 Max. I've done some stuff comparing that with metabolic cart on a few clients and myself. And they have published data on and also it's referenced on their site. And it does appear to be relatively accurate. Now again, it's an equation so it's not going to be as accurate as using a metabolic cart.

But if you don't have any fancy \$1,000 in equipment, it's a pretty good starting point. So if you want to know what your aerobic base is, that's one way to do it. The other way is a 12 Minute Cooper run test, find a relatively flat area warm up, see how far you can run in exactly 12 minutes. That'll give you an idea of your VO_2 Max also you can find an equation online, just type in 12 minute Cooper run test into your favorite search engine.

And you'll be able to figure that out. Now again, because the economy is different, your movement patterns rolling versus running, you may get two different numbers. All things being equal. If you're primarily doing running training for a marathon half marathon 5k Cooper run test is going to be a little bit more specific.

If you're more of a strength and power or recreational athlete, you don't do a lot of aerobic training, my bias is to use the 2k. Just because the mechanics are going to be a little bit better on your body, you don't have a lot of E centric loading from running, you don't have to worry as much about running mechanics, it's going to be a little bit safer. So my bias there is use the 2k on the rower. If you are in the very bottom percentage of vO two Max compared to the general population, there'll be various charts you can find for this data pretty easily.

Yep, doing some aerobic training is going to probably increase your heart rate variability. How that works is that the baseline energy system you're using, if you're just hanging out listening to this podcast, doing a walk, doing your dishes, driving, all of that is supported by aerobic metabolism. If your engine for that is really tiny, you're walking around kind of redlining yourself all the time.

So your stress is going to be higher. If you have a much bigger engine, ie your VO two Max, your aerobic engine is a lot bigger, you're using a much smaller percentage of it all of the time. If I have a V 12 engine, I don't need the rev the RPM super high to go fast.

If I've got a little complacent, you know lawnmower engine with a squirrel and a roller skate, then yes, I need to go to a higher percentage of that in order to get the same level of performance. So VO two Max is a way to measure that do some type of aerobic training to increase it if it's very low, you will see a transfer to heart rate variability in almost all cases. So that would be number one. Number two, we'll say lifestyle changes is going to be sleep. Again this is not taking into account the psychological.

I would say habit change associated with that. Right so if I could wave my magic wand and get everyone to sleep an extra one to three hours a night that would be amazing. However, as a habit change that can be much harder for people.

Things you can do to increase quality of sleep. I talked about sleep in the flex diet cert. Talk about exercise there too. For aerobic exercise, they go in more depth in that in the phys flex certification, but sleep There's going to be number one for lifestyle changes, I would say number two would be better breathing. If you can increase your economy or efficiency of breathing, that's going to be much, much better. So I'm a fan when you're doing your aerobic training to do it via nasal breathing, not mouth breathing, it's sub Max, you don't need to breathe out of your mouth.

And you can train yourself to do more nasal breathing, there is data to support that Nasal Breathing is more parasympathetic than mouth breathing. So lifestyle changes, sleep would be number one, breathing mechanics and efficiency, economy would be number two. If you can work with someone who can help you with that in person, that's helpful.

I like doing RPR, reflexive performance reset or deactivated training, I find that that makes a big difference. It's generally not a lot of fun. Most people's rib cages are really, really restricted, you should have an a perfect world expansion of the ribcage and the front, back and the sides so that when your diaphragm is working better, you're getting more expansion to becoming more efficient.

Just by doing that, I've done some experiments here where persons come in for an RPR session, we've been cool man, sometimes an hour, hour and a half just working on ribcage stuff, diaphragm, activation, etc. I'll even throw in some bastardize like PRI type exercises in there postural Restoration Institute, so shout out to Ron Roscoe.

And many times the next day, the HRV will be substantially better. Not in all cases, but in a lot of cases. So that would be for lifestyle changes, in terms of supplements, really depends on where you're at, you know, obviously, you know, food nutrition is going to be number one.

I think an area there that people miss, and I know I missed it for many years, is are you providing enough caloric intake to support your exercise, if you are not, and you're purposely in a fat loss phase, and that makes sense, right, you have to be in a caloric deficit.

However, if you are not, and you are being lower in calories, I find that that is a stressor for most people on their system. And the heart rate variability will be more on the sympathetic side, right, because trying to have the exact same output of your body or close to it in a caloric deficit is a stressor itself.

Again, this is more like a dial not a switch, the bigger caloric deficit that you have, it's going to be a higher stressor. So it'd be number one.

Number two, there is some data to support fruit and vegetable intake on heart rate variability. And this makes sense in terms of micronutrients, you want to have sufficient supply of micronutrients. In some cases, I have used a multivitamin, I'll place a link down below to the one that that I use, which I am an affiliate for.

But they do have lots of published data on the finished product. If that's all in intact and you're doing good. Next, I would say would be a fish oil supplement for online clients. And for people, I do use an at home test where you prick your finger bleed on some paper, send it in, and you can look at your Omega three status, I'll place a link to a podcast I did with Dr. Doug all about that.

Or if that's something you want to do, you can contact me we can do it through the mail, they'll send you the results, and they'll just give you my interpretation of them. You generally need to go relatively high. But this all depends on how deficient you are. Right. So that's why it's hard to give like a flat recommendation for amount of fish oil by its official oil is EPA plus DHA.

These are the essential fatty acids, most people are probably going to need to consume two to four grams of combined EPA and DHA per day according to most of the research. And that's the assumption that people are on the lower side, and that they're not consuming a lot of cold water fish. So officially, that would be my number one in there. Obviously, having sufficient calories and micro

nutrition would also be in their lifestyle would be sleep and breathing mechanics. Exercise would be some type of aerobic training.

Those would be the top interventions, I would have to increase heart rate variability. And then a side note, if you want to go beyond that, so you're doing good, you've got all of those in check. Yeah, and my bias would be looking at things that do homeostatic regulation in the body. So this is the basis of the physiologic flexibility, you can go to physiologicflexibility.com for all the information.

But the four systems there, number one is going to be temperature. So doing some controlled exposure to cold and heat, I've seen increases in heart rate variability over the long term. You can also use it to acutely measure if you overstepped a little bit, because remember that those are all acute stressors. But long term, once your body is building up more, kind of physiologic headroom in those areas, I do find that HRV generally gets better.

And by better wear meaning a little bit more on the parasympathetic side, so that you are better capacity to buffer stressors. The second one and the homeostatic regulators and the fifth like cert, this would be looking at pH, right. So you can increase and sort of literally dump more acid into the body by doing high intensity exercise, some breathing techniques, you can also do things to make the body more basic.

This is not all the weird detox, like eat basic food and alkaline diet and all that kind of stuff. Do breathing techniques. Yes, nutrition is involved in that too. Number three would be more on the metabolic flexibility sign. How well can your body use carbohydrates? How well can it use fat, so expanding out the energy in the fuel systems that you're using on both ends of the spectrum.

And number four would be the use of oxygen and carbon dioxide. You can do different things to purposely increase the buildup of carbon dioxide, such as high intensity exercise, breathing techniques, and you can do things to also expel more carbon dioxide. And what you'll notice is all these things are also interrelated to each other.

For example, if I am doing a super ventilation method, kind of like a fast in and out breathing technique, a lot like a Wim Hof or two mo breathing, I'm breathing out really fast, I'm also breathing in a little bit more deep. And because my respiratory rate is very high, I'm expelling more carbon dioxide. And when I expel more carbon dioxide, I'm removing an acid from the body.

So CO₂, form something with water called carbonic acid. And I'm literally temporarily making the blood a little bit more basic at that point. So again, all of these techniques kind of overlap each other.

So the big takeaway here is once you've got the basics down, that's primarily the basis of the flex diet cert, then you want to increase your resilience or robustness, your anti fragility, which is can be measured by your chronic level of heart rate variability, my bias there would be looking at the four homeostatic regulators, and that system would be the physiologic flexibility system. And thank you so much for listening to the podcast today.

Really appreciate it. Hope you enjoyed this installment of the Ask Me Anything series brought to you by flex diet certification, go to flexdiet.com for all the information there. If you're looking for a complete system to maximize your ability to recover primarily via nutrition, we cover everything from protein to fats, carbohydrates, NEAT, such as walking, exercise, sleep, micro nutrition, and much more.

This is all designed to increase your body's ability to recover if you're training to add lean body mass performance, and do it all in a flexible approach without destroying your health in the process. There'll be a notice there to get on to the newsletter for the waitlist. I will also be sending you lots of great information in there via the newsletter.

Most of my content now actually goes out to the newsletter. Thank you so much for listening, and really appreciate it. As always, if you would place a review below whatever podcast you're using, whether it's iTunes, Stitcher, Spotify, etc.

Really helps the program and allows us to get more interviews with other people and keep bringing you great content. So any feedback you would like to see also please drop me a note. Thank you so much for listening. Really appreciate it.