

FD_podcast-IF-Dr-Stratton

[00:00:00] **Dr Mike T Nelson:** Welcome back to the Flex Diet Podcast. I'm your host, Dr. Mike T. Nelson. Now in this podcast, we talk all about things to increase your performance, ability to add more muscle, improve body comp, all without destroying your health in a flexible framework. Speaking of a flexible framework today, we've got Dr.

[00:00:24] Matthew Stratton and we're talking all about intermittent fasting, commonly known as IF. There's different forms of intermittent fasting. I, overall, I do like intermittent fasting. Again, I don't use it for everything. I don't think it's to be all for, end all for a hundred percent of cases. But it is something that I do include in the Flex Diet Certification and it was one of the top interventions.

[00:00:51] Out of eight interventions, I actually ranked it number two. So I do think it has a lot of useful practicality. But there's some interesting research around it. And Dr. Matthew Stratton is one of those people who has published some of that research. So we're going to dig into all things related to intermittent fasting today.

[00:01:14] So Dr. Stratton did his Ph. D. in Exercise Physiology at Texas Tech University, where I graduated last year. He did an M. S. in Applied Exercise and Health Science from Kennesaw State University. We talked a little bit about his background here on the podcast. And it is Bachelors of Science in Exercise Science from the University of New Mexico.

[00:01:36] So I've seen him present a couple times at ISSN. He did a great talk again there this past year. And I think you'll really enjoy this podcast here. And if you enjoy this podcast, be sure to check out all my old podcasts and guest podcasts. You can go to MikeTNelson.com forward slash podcast. There's also a way on there to get on to the newsletter now that is where about 90 percent of the information I put out now Goes directly to the newsletter work to try to make them somewhat entertaining and informative at the same time And it's free to join and worst case scenario if you don't like it, you can unsubscribe So go to MikeTNelson.com.

[00:02:17] [com](http://MikeTNelson.com) forward slash podcast for all of that And enjoy this podcast here with Dr. Matthew Stratton.

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[00:02:30] **Dr Mike T Nelson:** welcome back to Flex Diet podcast and today we're going to talk a little bit about some Intermittent fasting and some other great topics.

[00:02:39] So how are you today doc doing

[00:02:42] great yourself doing good

[00:02:44] It was nice to see you again at the ISSN meeting. Thank you very much for your talk that you gave there I thought that was yeah, it was really good

[00:02:52] **Dr Matthew Stratton:** Yeah, it's always a fun time. That's always a one that I try to hit up

[00:02:55] **Dr Mike T Nelson:** every year. Yeah. And I guess the main topic today we're talking about is intermittent fasting.

[00:03:03] I know you've published some research, I know on this related to some performance metrics and body count. I guess to start off, like how, how did you get interested in that line of research?

[00:03:15] **Dr Matthew Stratton:** It's especially with. With intermittent fasting specifically, it's a roundabout way where I got really interested in research during actually I was in undergrad at the time, but I actually wasn't an exercise science major yet.

[00:03:30] I had a bunch of jobs in the fitness industry. I was a personal trainer for a couple of years, and then I worked at a supplement store for a couple of years. And then when I decided that I wasn't really into. What I initially was studying in college, which was music performance anymore.

[00:03:48] **Dr Mike T Nelson:** I a little bit of a hard turn performance to exercise physiology.

[00:03:54] **Dr Matthew Stratton:** That's always a funny one to people. And there's even a longer read about way about how that kind of came out, but I was, yeah, I was the semi professional musician for a long time, but as a lot of musicians can tell you, it can be hard to pay the bills occasionally with that, especially in classical music, which was my focus.

[00:04:11] And so what did you play? I was a trumpet player. Oh, okay. Yeah, I did that for a long time, played in some good orchestras, got to travel across Europe and stuff for it. It was pretty cool. But When I started to get burned out on that lifestyle since a lot of the side jobs that I used to also supplement the income were all in the fitness industry, started thinking like, what could I do?

[00:04:35] And so then I switched over to exercise science because that kind of was up my alley. But while I was a personal trainer and working at a supplement store and stuff, I always tried to. Dive into the research a bunch to basically make sure that I could help either my clients or customers and stuff like that as much as possible.

[00:04:58] And so once I got into the actual field and got an opportunity to start helping out with some research at, it was at the university of New Mexico under Dr. Van Dusseldorp, who she was a doc student. Yeah, she was a doc student at the time. Oh, I didn't know

[00:05:15] **Dr Mike T Nelson:** that. Yeah, so small world. Yeah very small to Trisha.

[00:05:20] **Dr Matthew Stratton:** And yeah so Trish was a doc student at the time and I ended up being one of the first participants in her dissertation and then ended up helping out with it a bit on the research team, which really solidified that I really liked the research route. And I really wanted to continue going down that for a living.

[00:05:40] And then when she graduated from New Mexico, she got hired over at Kennesaw state. And so then when I was getting ready to graduate about a year later, she called me up and said, Hey, do you want to come to your master's over here? And. So I said, sure. So I packed up everything and moved across the country from New Mexico, all the way to Kennesaw, a little about outside of Atlanta.

[00:06:04] And and her research and a lot of my interests had always been around the nutrition supplement side. And so that's a lot of the stuff that we were doing, but And with that, I had, especially before I got into the major, I had dabbled a lot in like the specialty diets, trying them on myself or trying to read on much, much, including intermittent fasting and like keto, all that kind of stuff.

[00:06:28] And intermittent fasting was the one that always I gravitated to the most, I guess you could say, because. One of the things that I liked about it is to

me, it seemed to have kind of the best utility for most people. And what I mean by that is most of the specialty diets out there that you see, it's always avoid this macronutrient or cut all of these out or have to do all this kind of counting and stuff like that.

[00:06:52] And for what intermittent fasting was, it was basically just saying Hey, still just continue to do your. Daily life, just only try to eat between this time and this time. Like we're not telling you what to eat or how to eat. We're just saying Hey, just try to fit your meals between these two times.

[00:07:11] And then outside of that, you do you. And that seemed like a very flexible way that kind of helped gravitated to working into most people's daily life. And then when I was getting ready to do my thesis for my master's. We had this kind of intermittent fasting study that had been on the table for a bit that my advisor, current advisor at the time, Tricia, and my future doctoral advisor, Grant Tinsley had been talking about and So I ended up taking that over, messing with it a little bit to fit my interests because I looked around and said, there's a couple, there were at the time, there were about three studies using resistance training, which is, the modality of exercise that I prefer to study.

[00:08:01] And. Intermittent fasting, but I didn't really think any of them actually hit the mark on what a lot of people are using intermittent fasting for for instance the one big one, the moral 2016 paper at the time that a lot of people still like to cite that one was looking at, it was a really good study was looking at intermittent fasting when people trying to either stay the same weight or slightly gain weight.

[00:08:25] And I've never met anybody that says, I want to gain weight. What am I going to do? Stop eating. Never. I've never seen that. And then both of the, in the Tinsley 2017, the Tinsley 2019 paper were similar where the 2017 paper, it was, there wasn't that much kind of dietary control.

[00:08:46] It was more of we asked these people to start eating like this. How do they change their behavior? What happens, how do they change their intake, which is great information, but it doesn't really answer the question. Does fasting do anything? And then same thing with the 2019 it was, they were looking at more trying to say like body recomposition as opposed to where most people are trying to say, lose weight when they go and utilize these So I decided to run the first study at the time where people ate the same amount of food and trying to get them to lose weight and lift it and saw what happened.

[00:09:20] And then and then Grant was on the committee for that. So my thesis committee, and then during that. He called me up and said, Hey, we're starting a doc program over here at Texas tech. Do you want to come over here and be my doc student? And since he was one of the few people doing intermittent fasting research at the time, and I really wanted to continue doing intermittent fasting, packed up everything and moved to scenic Lubbock, Texas, which That sentence has never been said in earnest.

[00:09:49] **Dr Mike T Nelson:** Yeah, I've been there once and I was like, interesting.

[00:09:54] **Dr Matthew Stratton:** That's a very good way. Great place to do grad school because there's not anything

[00:10:00] **Dr Mike T Nelson:** to distract you from grad school. Yeah, not a lot of distractions. There's that one bar in the corner and I think that's about it. Pretty

[00:10:05] **Dr Matthew Stratton:** much. You got Texas Tech and then that's pretty much Lubbock.

[00:10:09] But then spent three years out there. Immersing and everything regarding fasting and body composition assessment and continue to doing some supplement work. And then for my dissertation I got really interested as well in how things like breakfast could potentially affect training and such, because the number one meal that most intermittent fasting protocols will tell you to get rid of is breakfast.

[00:10:33] Like the vast majority of it is just skip breakfast, eat later in the day and see what happens. And so we Basically looked at, how does eating breakfast, like affect your performance later in the day after you start eating for those that maybe skip breakfast, but still train in the afternoon, that, crowded gym time that anyone's ever been to an afterward crowd knows that's the vast majority.

[00:10:54] So how does, how might intermittent fasting protocols like affect something like that? And so we've got that kind of under review and then. That kind of leads us to today,

[00:11:04] **Dr Mike T Nelson:** very cool. And we should probably back up and give a definition of. Intermittent fasting. So the two part question is what is your definition of intermittent fasting?

[00:11:14] And then I think most of the studies you were referring to were using kind of 16 eight protocol, correct?

[00:11:22] **Dr Matthew Stratton:** Yeah, so it's a very good point that we always need to define this and so what? Intermittent fasting actually is, despite what a lot of people think, it's a very blanket term. And so it encompasses a really broad spectrum of protocols, everything from ADF or what's known as alternate day fasting, where you will have someone typically eat one day, eat normally, and then perpetuity.

[00:11:57] Or what's sometimes called periodic fasting, where it can be anything from a 24 hour fast once or twice a week to some of these slightly more extended fasts say, 48, 72 hours. When it gets to 72 hours, that's when we might start classifying it outside of intermittent fasting and closer to what we call extended fasting.

[00:12:18] But popular protocols, say something like eat, stop, eat is a very popular protocol, which is that 24 hours, once or twice a week, where nice thing is you still get to eat every single day even though there's the 24 hour fast in there, which something like. Alternate day fasting might not allow, but the one that most people think of when you say intermittent fasting is one that we in literature like to term time restricted eating.

[00:12:45] It used to be termed time restricted feeding. So TRF more recently, there's been a push to move from TRF to TRE or time restricted eating. But that's going to be those kind of. shorter daily fasts. And when I say shorter, most people might think a 16 hour fast or an 18 hour, 20 hour fast doesn't sound like a very short fast, but it's short in comparison to these like 24, 36, 48 hour fast that some of the other protocols are.

[00:13:13] But some 16 and eight is going to be the most common one that you see. out there, which is 16 hours of fasting versus eight hours of feeding. So an example of that would be eating every single day, but only between noon and 8 PM. It's basically skip breakfast, have lunch, maybe have a mid afternoon snack, have dinner, and then carry around your day.

[00:13:34] The next most common one. And that I should say, that's going to be the version that's in a lot of the more recent studies, as well as say, like the moral study that I mentioned earlier the Tinsley 2019 paper study my studies, those are all using that kind of 16 and eight protocol. The other really common one you might see occasionally is what's called a 20 and four protocol where fast for 20 hours a day.

[00:14:01] Then eat for four hours a day. So my eat seems four and 8 PM or something like that. That one's a little rare, but I do come across that one in the field quite a

[00:14:09] **Dr Mike T Nelson:** bit as well. I think that was originally off of Ori Huffmackler stuff from the warrior diet, I think, wasn't it? He was the first person I ever heard like talk about fasting.

[00:14:18] And then Brad Pilon was the second guy I heard more popularized it.

[00:14:23] **Dr Matthew Stratton:** Yeah, Ori Hofmeckler's book Warrior Diet which is interesting he actually, for the most, throughout most of the book, doesn't actually advocate that much for a 20 and a 4. Not

[00:14:33] **Dr Mike T Nelson:** really, but that seems to be what is associated, and obviously he popularized it from there.

[00:14:38] **Dr Matthew Stratton:** Yeah that's where he for instance, he talks about during a lot of it eating more of just like just straight protein as opposed to straight fasting. But yeah, the warrior diet is typically accredited to Ori 4 just like the 16 and 8, which for a long time was termed the lean gains diet.

[00:14:59] Yeah. Because Martin Bergkamp from, Yeah. Lean gains was one of the first people to popularize that. Then there was a big, a really popular one, a book from men's health came out called the eight hour diet, which basically copied most of

[00:15:12] **Dr Mike T Nelson:** his almost identical.

[00:15:15] **Dr Matthew Stratton:** I think he literally just went to the wing gauge website and just like copy pasted.

[00:15:18] Yeah.

[00:15:19] **Dr Mike T Nelson:** Do you ever met Martin in person? I have not personally. I haven't either. I've heard he's quite the character.

[00:15:25] **Dr Matthew Stratton:** That's what I've heard. I've talked, everyone I've talked to that has met him said he's quite the character. And then yeah, Brad Pilon's eat, stop, eat is the most common like whole day fasting which for a long time it was.

[00:15:36] It's called whole day fasting. Now I've moved to categorizing it under that periodic fasting. But I said, those are the most common and that's, I think that's also a great example of one of those times where we see stuff start to get really popular out in the field. And then a lot of us researchers start lashing on and go, okay, this is really popular.

[00:15:53] Let's start seeing if it actually does anything. And then it like balloons into this whole field to this. Now point that, in the research world especially if you're looking at reviews, like intermittent fasting is one of the most popular thing to find a review on to the point that we have, I think close to three times as many reviews as we have actual studies now.

[00:16:15] **Dr Mike T Nelson:** Pet peeve with that. And not that there's not a good place for reviews, and I love a good review, whether it's meta analysis, narrative review, whatever. It's a great kind of one stop shopping, jumping off point, especially if you're new in an area, but it seemed especially when COVID halted a lot of original research because labs are just physically shut down, the amount of reviews on topics Got a little bit crazy in my opinion, but I get it.

[00:16:41] You need to put out papers, you need to do something. So I understand why it happened. Oh

[00:16:46] **Dr Matthew Stratton:** yeah. And I, and it's a pop, especially the internet fasting. It's a popular topic, but I, I remember when I was writing my dissertation, just looking around like three new reviews getting published every single day, and I'm just looking around going, we don't have enough new data,

[00:17:00] **Dr Mike T Nelson:** no new data in that time point.

[00:17:02] **Dr Matthew Stratton:** Like just stick with what we had. All right. Yeah. Cause then you publish it. Then I have to read it and I'm trying to write my dissertation. I don't have time to read this.

[00:17:12] **Dr Mike T Nelson:** Yeah. And like you said, you're trying to straddle, various types, 16, eight versus, like Krista Verde has done a lot of the alternate day fasting and they're trying to wedge all these things under the term of fasting.

[00:17:25] But yeah, and I get it because there's not quite enough data, especially some of the early ones to only look at 16, eight or only look at one type. So you're trying to. Make these corrections and extrapolation based off of

different types because they're all intermittent fasting and I don't know. I think it just it got quite confusing

[00:17:45] **Dr Matthew Stratton:** and for you bring up a very good point that for especially a lot of people should be aware that for a long time, the vast majority of the fasting research that came out was alternate day fasting or alternate Modified alternate day fasting, modified alternate day fasting is essentially just on instead of doing a full fast day, you would have a small meal is typically about 25 percent of your normal daily calories around the noon time around lunch and then outside of that You would still fast like normal.

[00:18:16] And they just found that kind of helped with people actually following alternate day fasting, but the more common versions, like the 16 and eight or the 20 and four didn't start showing up in the literature really until about 2016, 2017.

[00:18:30] **Dr Mike T Nelson:** Yeah. And then obviously you've got some research on Ramadan, which is its own thing per se, I would say.

[00:18:37] **Dr Matthew Stratton:** Yeah. Very, it's very much. So it's own thing. A lot of people like to group Ramadan literature with an intermittent fasting, but it's very hard to do considering the fast can vary widely depending on where in the world that data was collected or the time of year that Ramadan fell upon that year.

[00:18:54] Sometimes the actual amount of fast. For Ramadan isn't coming close to the length of time that some of these intermittent fasting protocols are actually advocating for.

[00:19:05] **Dr Mike T Nelson:** How did you settle on looking at the 16 and 8? Was that something you've observed in your own life, your own hypothesis, or was there just more research on that from obviously Grant Tinsley has done a lot of, stuff in that area, so you wanted to continue on in that area, or what made you go that direction?

[00:19:23] **Dr Matthew Stratton:** And so for the the initial reason I was actually mostly interested in 16 and eight is just because it was the one that I saw the most people doing. And so the biggest thing in my mind is I wanted to study what most people are actually doing to try to figure out what is actually going on there. And so in term like working in stores or with people or just in general trends, 16 and eight was the one I saw come up by far the most.

[00:19:59] And at the time when I was doing, so it was 2019 when I was doing that study or actually yeah, it was January to April, 2019. And at the time there had only been two studies published that had used 16 and 8. And so it was the Morrow 2016 and the Tinsley 2019 which had used 16 and 8.

[00:20:25] So it was something that I saw that was very common out in the field, but had not been very well represented in the literature. And so because of that, I wanted to dive into it. And I also think it's one of those protocols that is a little easy for people to introduce themselves to because I know a lot of times when you first tell people like, Oh yeah, don't eat until noon or something like, it's the old thing of, as soon as you tell somebody you can't have something that's immediately what they want.

[00:20:54] Yeah.

[00:20:54] **Dr Mike T Nelson:** Yeah. As soon as. Don't think of a pink elephant. Oh, pink elephants.

[00:20:58] **Dr Matthew Stratton:** Exactly. And, but when you think, when a lot of people actually think about their normal daily life, like it's. Pretty close to what a fair bit of people do where you wake up too late. So you don't really have breakfast. And then so you might have some coffee on the way to work or something, and then you get busy at work.

[00:21:16] And then the first time you really have that much substantive food is around lunch. And that's essentially, the start of a 16 and eight protocol. So I think that's one of the reasons it's really popular and I got into it because I just didn't see a lot of literature on it, but I saw it really popular in the field.

[00:21:38] Now, because of that, it's, there's starting to be a little bit more literature coming out using 16 and eight. Which is good to see. I think one of the big things now that would be good to start going to, there's one study, I know that's Aaron Quaygo's paper, but also starting to examine 16 and eight versus six and 18 or four and 20, like what are the big differences we're seeing there?

[00:21:57] Cause so far there's only one paper where that's actually compared some of those protocols directly head to head. So nothing in exercise.

[00:22:06] **Dr Mike T Nelson:** Do you know the origin of the timeframe of the 16 and 8 what I was told. And again, I don't know if this is true or not, or if it's a different realm, but supposedly from Sachin Panda's lab, he was saying that the

reason they used an eight hour feeding window was just the practicality of running things in the lab, because you would have, if you're doing a controlled feeding study, so like an acute study.

[00:22:31] You would have eight hours where people are going to be monitored. You'd have an hour or two, maybe a setup before and an hour or so after that. And that asking grad students to stay in the lab for, more than 10 to 12 hours at a time is just unreasonable. So they needed something that had a working timeframe and they just picked eight hours.

[00:22:51] I don't know if that story is just complete folklore by this point or if there's any truth to that.

[00:22:57] **Dr Matthew Stratton:** If Satchin's actually considering that for his grad students, then he's doing good. Cause there's a lot of doc advisors out there that would just be like, I don't care, get it done. Oh

[00:23:08] **Dr Mike T Nelson:** yeah. My advisor would be like.

[00:23:09] I don't care, sleep in the lab, figure this shit out.

[00:23:14] **Dr Matthew Stratton:** I gotta give him credit if that's one of the reasons he picked eight that. I could see that. There are some metabolic rates I could see potentially closer to this, the 16 hour fast, like around 16 hours, you start to see some shifts in metabolism.

[00:23:32] But as far as I'm aware, or I can see that definitely being a good reason for the origin of it. My, my origin of it is just the I'm starting to see it pop up everywhere. And then every time I tried to dive into it, it was just, yeah, this is what people do. Okay, that's not a great reason for an origin, but I know where origins for some of the versions.

[00:24:01] So for instance one of the reasons people have advocated for say 20 and 4 in the past is because around the 18 hour mark you start to see some shifts in especially sympathetic nervous system activity, which can, which impacts say like fat oxidation seems to go up around 18 hours.

[00:24:16] So you get a little bit of extra time if you fast past the 18 hour mark that type of thing, but especially for 16 and eight, and then some of the other ones, say like the 14 and 10 those are a little bit more for looking at things like feasibility. I know that's one of the reasons modified alternate day fasting came

about is because they just noticed that they were having astronomically high dropout rates for studies.

[00:24:41] And so they, people just couldn't do it. So they're like if we give them a little bit of food on the, on that fasting day, it helps with lean body mass retention. And then also people can stick to it. And that's one thing I think we need to remember when we're designing some of these protocols, I think some people like to lose.

[00:24:59] Lose sight of, they don't like to lose it. They just lose sight of in the industry is that all these, like you can design the most scientifically correct, best, correct protocol out there, but if people can't stick to it, it doesn't matter. So to making these little trade offs of yeah, this, we like, we might not be hitting That slight shift in fat oxidation around the 18 hour, but my client can actually stick to it longterm.

[00:25:26] We'll do this different protocol, that type of thing.

[00:25:29] **Dr Mike T Nelson:** Yeah. I think there's some data that insulin levels and healthy people fall down and hit like kind of a flat point at around, I think it's like 14 to 16 hours or somewhere around in there if you're just completely fasting too.

[00:25:42] **Dr Matthew Stratton:** Yeah, I have, I as part of my PhD work, I've published a.

[00:25:45] paper in nutrition reviews, going over all of that, which today is actually one of the papers that I'm most proud of, but it's no reads, which makes me sad.

[00:25:55] **Dr Mike T Nelson:** What's the reference we'll make sure to link it

[00:25:56] **Dr Matthew Stratton:** here. So it's called a physiological adaptations to acute fasting. And it's in the journal of nutrition reviews as part of my as part of my PhD.

[00:26:08] Like we had to write a review. And so that was one that I had always been interested in. It was like the timelines. And so one of the reasons when that was as a way of trying to say if you are actually trying to develop some of these protocols, if you're trying to see certain physiological adaptations, you need to know the timelines that some of these are going to happen. So the point of that paper was hopefully like if you wanted to see certain rising ketones or certain

plateau out of insulin levels or something like that, how long do you actually need to fast to have that? So you can make sure that you're designing protocols that actually achieve that.

[00:26:43] Or why

[00:26:43] **Dr Mike T Nelson:** you mentioned it. What would you say is the length of time for fasting for most people to see? I'll say a significant rise in ketones, but you can define that as to whatever level you think is significant,

[00:26:56] **Dr Matthew Stratton:** we can see actually a measurable rise in just after an overnight fast. But significantly And of course, this is going to be very dependent on a lot of different

[00:27:10] **Dr Mike T Nelson:** things.

[00:27:11] Yeah, exercise, metabolic health, a whole bunch of stuff. Yeah,

[00:27:15] **Dr Matthew Stratton:** adiposity was how, yeah, basically everything you just mentioned, yeah. But I was like, yeah. And but I'd say much closer to around that like 14 to 16 hour mark. Is because one of the big things that does need to happen for that is, liver glycogen levels to start to be depleted, which they can be depleted after an overnight fast.

[00:27:40] But and if you're looking for a certain percentage, I do have a nice chart in that paper that actually shows the percentages that all the different studies showed with different lengths of fasting and all that kind of stuff, but also one of the issues. I will state, say that it's interesting when diving into that literature, when trying to say how much of a rise, most of those studies don't start actually measuring baseline until close to about 12 hours of fasting already.

[00:28:07] Oh, interesting. There are only a few studies very few studies like the Klein 1993 and such that actually looked at, say, time points only at, say, four or six hours postprandial. So after finished eating, vast majority of studies didn't actually start collecting data until about, Eight to 12 hours after eating of

[00:28:33] **Dr Mike T Nelson:** fasting, just a practicality thing, or it's the old school thing where, have your last meal at a certain point, come into the lab in the morning, fasted, and then they do all their poking and prodding during the day.

[00:28:44] So their first meal Measurement might be whenever they get them into the lab in the morning.

[00:28:49] **Dr Matthew Stratton:** That's definitely, I think, part of it. Some of those papers are, some of the better ones are inpatient studies. Oh, nice. So where they were able to continually draw over time. But as anyone that's been in research can tell you, that's very expensive and very hard to do.

[00:29:06] And you need to have very specialized facilities, which is why a lot of us don't do it. But I, but i, that's one of the big things that I know I really had to come to grips with and learn when I started getting into research is when you start reading a lot of things and you're like, why didn't they do it this way?

[00:29:22] Why didn't they do it this way? It starts to learn it's because of practicality things like you're mentioning, whereas like for a lot of those, they tell an individual, all right, have your last meal at 10 PM and then we'll see you in the lab at 6 AM. That ends up being an eight hour fast as opposed, cause they're not going to be able to draw.

[00:29:41] All the blood markers and everything that they want at 4 a. m. Because hopefully they have advisors like Panda, that isn't attending their doc students to their house or making the park. Cause if I, cause same thing, if I told the participant to come in and be like, you're going to sleep in the lab and we're going to draw you at four in the morning, trying to recruit for that study would be impossible.

[00:30:03] **Dr Mike T Nelson:** Yeah. It's hard enough to get. I found average college students to come in the lab to exercise at 5 30 in the morning. That was difficult. And you tell them, Oh, it's going to be a max test. And then God forbid, if you have any blood draws on top of that, like a good trigger mark.

[00:30:17] **Dr Matthew Stratton:** And then if you get the participants that, that we really and we, people like to complain that we don't have, so like the really well trained participants, as soon as you tell them they need to change their They're training a little bit and be like, Oh, we need you to take a couple of days off or yeah, or this next three weeks of training might look a little bit different than everyone's like, all right, I'm out.

[00:30:38] **Dr Mike T Nelson:** Yeah. And I get that. Like, when I was at the University of Minnesota, my buddy Cal Dietz was, he's still there, but he was running, a lot of the collegiate strength and coach coaching there. And so I often

joke that I'm like, if I went over to him and I need like your top, two dozen athletes that I'm going to have.

[00:30:55] Them do your normal protocol and I want to put them on my special protocol. I want to look at over here And I want to run this for four months. Oh in your peak season He'd be like f off screw you like what are you doing? Like his entire job Is to get the best results safely that he can from his athletes.

[00:31:14] His job is not to Give me athletes to screw around with in a study because they may study may not work You know, it's like I get The criticism that we need more elite level athletes. And the answer is yes. But the practicality of doing that, especially in the U S is very difficult

[00:31:33] **Dr Matthew Stratton:** very difficult.

[00:31:34] And that's what I tell a lot of students where They'll say I really want to study this one population because I can't find that much in this population. And after I was like, I guarantee there's people before you that have come before you that want to do the research in that population.

[00:31:47] The reason that there isn't that much literature in that population is because that population is Next to impossible to recruit whatever it might be. Yeah, and A lot of times we only have the unfortunate aspect is we only have a certain amount of time to do studies Yep. And especially at universities, a lot of our studies have to run in concert with the semester.

[00:32:14] So one of the reasons why you don't see a lot of studies past say 12, 16 weeks as well as because how long is an academic semester here, 16 weeks. And if you try to, and most of our participants are say students. And so as soon as you get around holidays or at the end of semesters, they're going home, they're leaving campus.

[00:32:33] And then all of our participants just left. So good luck if you wanted to do a 20 week or something like that.

[00:32:41] **Dr Mike T Nelson:** Yeah. And even just the amount of expectations of it, I just studied on energy drinks and yeah, we had a randomized placebo controlled arm, all that kind of stuff. And people are like, Oh, But you didn't use water as a placebo.

[00:32:54] Like we used a non caffeinated version that didn't have the other ingredients in it. And I'm like, okay, that's a fair criticism. But to add a third arm

onto that study means that it's going to be longer. It's going to be more expensive. The people have to come in from one extra time. They're already doing three max tests during it.

[00:33:14] So now you're asking them to do a fourth max test. And as if you run the stats on that and people start dropping out. You can't really use anything from their other two trials either. So you run the risk of potentially imploding your whole study by adding another arm. It may work out. It may not.

[00:33:32] You don't know until you're almost done with the darn study. So it's just ah, I'm not risking it. I don't, someone else can run that one. I agree with the statement. Yes. But I want to graduate

[00:33:44] **Dr Matthew Stratton:** exactly. We did, I did a very similar one with pre workouts and Texas tag, where we looked at a caffeinated pre workout, the same pre workout, but without caffeine and then placebo.

[00:33:56] But one of the, like if we wanted to do a say caffeine only version of it. Then similarly, that would have moved the number of total visits from 75 to a hundred. Yeah. And just even outside of all that, the amount of extra work then, logistics to lab to do is crazy. So we, you start learning all the little trade offs and then all of a sudden all the things that you're sitting there going why didn't they do this?

[00:34:24] Why didn't they do this? All those things that are making sense. You're like, Oh, okay, I get it now.

[00:34:29] **Dr Mike T Nelson:** Out of curiosity, what did you find in that study? Okay.

[00:34:32] **Dr Matthew Stratton:** So for that particular study we did not find a difference in main performance between any of the three conditions. We didn't. And what were

[00:34:41] **Dr Mike T Nelson:** the three conditions again?

[00:34:42] We had the pre workout.

[00:34:44] **Dr Matthew Stratton:** Yeah, we had a caffeinated pre workout. Okay. We had so it was pulses legion, or sorry, legion's pulse pre workout. Okay. Lesion. Yeah. Workout was pulse. And so we looked at their caffeine, the

caffeinated version versus the non caffeinated version versus placebo and which was just crystal light.

[00:35:03] We just wanted something that tasted the same and main differences. We didn't find any real isometric.

[00:35:13] Mid thigh strength. And so how that worked was isometric half squat is we had a really cool kind of isokinetic squat device, and it was a pain to use, but gave some interesting data. And so when people in both of the pre workout groups. So caffeinated and non caffeinated when we set the device it essentially would be a half squat for them and then just ask them to push against it as hard as possible.

[00:35:42] Both pre workout groups did better in that version in that test than the placebo. there wasn't a difference between caffeinated and non caffeinated. When we looked at 1RM and repetitions to failure, there wasn't any difference between any of the three groups.

[00:35:57] **Dr Mike T Nelson:** Interesting.

[00:35:58] **Dr Matthew Stratton:** But yeah, so that was, I think one of the, we also used a absolute dose, which we tried to limit it so that every time that someone took someone, if they would fall still within that three to six milligrams per kg.

[00:36:14] So limited body weights coming in for that. So it was still within the physiological dose, but the lighter females versus larger males. There's some stuff there also one of the things that I think back to that study a lot is how off, how often does someone go into the gym and just do a one RM bench and then throw 65 and then a certain percentage of their body weight on the bar and see how many reps you can do to do a one RM leg press and do the same thing and then leave.

[00:36:45] It didn't. Impacted in those methods, but I'd still argue that there's good argument for why you might want to particularly some people might want to take one even for just general workouts because one that's not the most ecologically valid testing to see how it's going to affect say, a normal workout that someone might go do, but it's what the company wanted.

[00:37:06] So we gave them what we tested the variables that they wanted and. Nice thing. Good thing about Legion is they didn't care whether they, we found no results or positive results. They let us publish it either way. But they were

curious how it affected muscle muscular endurance and maximal strength. And so that's what we tested.

[00:37:26] But also, especially for pre workouts or energy drinks and stuff like that. I think there's a lot of psychological aspects that go into it. People want to take their pre workout and then go, okay, now I've taken my pre workout now it's time to go train. So whether or not it's actually that pre workout is actually improving their performance in the gym, that pre workout got them to the gym.

[00:37:47] And they're going to get more, better results because they actually went to the gym. Versus if they didn't take that pre workout, they might have not trained at all. So even if it's just the non caffeinated ones, like there's some behavioral aspects that I think they can be beneficial for.

[00:38:04] **Dr Mike T Nelson:** Yeah. And there's something to be said about the ritualistic aspect of it.

[00:38:08] And you're having the same kind of flavor and also a tip to all the bros taking their pre workout in the locker room before they set foot on the floor, unless your warmup is 30 to 60 minutes, you may want to back up your dose a little bit sooner than that, because like peak levels of caffeine are like 30 to 60 minutes, somewhere in there.

[00:38:31] So what was the dose of caffeine on that? Just out of curiosity.

[00:38:36] **Dr Matthew Stratton:** I believe it was 300, it was 250 or 300. Oh, okay. So significant. And yeah, it was a good dose. And also the one thing that I liked about it, which I'm partial to ones that also include theanine in it just because I found theanine doesn't make the caffeine hit quite as hard.

[00:38:55] **Dr Mike T Nelson:** Yeah, it definitely mellows it

[00:38:57] **Dr Matthew Stratton:** out. Exactly. And so that had a good dose of the eating in it to help with mental focus a little bit more. But also like I've noticed with some of the higher ones and I know, I remember a time in the sub ministry when three through 50 was like really high.

[00:39:11] And I was like, Oh crap. Now I talked to a couple of my students that are also working at some of the local supplement stores. Oh yeah, we just got this new one in that has 600 milligrams of caffeine. Oh my God. And but. When the occasionally, especially say if it was like a leg day or squat or something like that, where you're shooting, you're getting your heart rate racing.

[00:39:30] If I had something that had a decent amount of fading in there, then I'd still get a little bit of the perk. But I noticed my heart wouldn't, I wouldn't feel like I needed to find a respirator after every single set.

[00:39:40] **Dr Mike T Nelson:** Yeah it does feel surprisingly different. Like I've used a mix of 400 or 500 milligrams of caffeine with 200, 250 milligrams of L theanine, just to see what the difference was.

[00:39:52] And it definitely is. Very noticeable. And I actually don't like it as much. It's a, if you've ever done it, it's a weird feeling. It's like you, you don't have quite that, I guess I would relate it to almost like sympathetic drive, but yet you still feel the effects of caffeine. It's a very, I don't know why I just.

[00:40:14] Like the sensation of it for some reason, but I know a lot of people like it better.

[00:40:19] **Dr Matthew Stratton:** And it was actually funny as we were getting ready to do that. So that particular study the tubs that we got sent were unmarked obviously so that we could all stay blinded, right? But the person who was mixing it.

[00:40:32] So one of the things that I thought was actually really cool about that particular studies, a lot of people will do double blind, placebo control, all that kind of good stuff. But actually the person who mixed the drinks, didn't interact and knew it didn't interact with the participants at all, essentially.

[00:40:48] So they had a. They mixed it in a different room and then came in and put it in the fridge so we could control the temperature that they drank it at and all that kind of stuff that was in the testing room and then left and then we didn't see them at all so we could keep all of that separate. And we.

[00:41:10] And but so at one point he was trying to, the guy who fixed all of it was trying to figure out essentially which one, after we wrapped the study and everything, he was trying to figure out which one's which, so he was trying all of them and. He was like, Oh yeah, this one, it has 300 milligrams of caffeine.

[00:41:26] That should be pretty obvious. Which one's the caffeine one. And then I remember him drinking it and he was like, yeah, I don't, this is weird, man. I don't know what's going on. Like I think this is the caffeine one, but I don't know because. Like I'm not getting the normal caffeine hit because of the theanine.

[00:41:41] It's very different, but that was, I just don't remember walking around the lab like that. And it was really funny cause he had never tried one like that.

[00:41:48] **Dr Mike T Nelson:** Yeah. And definitely, I know the trend is higher on caffeine because in terms of legal stimulants. The only one left. There's some gray area stuff, depending upon how far you want to push the line, but it just seems like we've seen trends of, Oh, like in the past it was like, how concentrated can you make your pre workout?

[00:42:08] And if you have in this tiny scoop, that was better. And then it was like the kitchen sink version again. And then it was like, no, we don't want too much caffeine and. They had DMMA and other, things you could put in and now it's back to, oh, but people want a stimulant effects. We're back to pipe reducing on caffeine again.

[00:42:25] Yeah. It's

[00:42:25] **Dr Matthew Stratton:** getting close to the, I remember back when one MR and one MR vortex and all of the, and the original nitroflex and all those were getting really popular. But the funny thing is even back then. The super high dosed ones, like I remember at the store, the original proceps, Mr. Hyde was the highest caffeine dose one we sold, which was 419 milligrams of caffeine.

[00:42:51] Then, and a little time when you'll him buying were Wolf Hornady and Sinephrine on top of it, but 419 now while still up there, you have a very wide range of ones that are that and above at the time that was like a hundred milligrams more than everything else. So it's crazy to look back and granted that was 2015.

[00:43:12] So even before that, like. It when I started getting into it, but when we started selling them, that was in 2015 to 2017 ish around there, 2014. Yeah. That it's still crazy to look back and Oh, that was seven, eight, nine years ago now. Yeah.

[00:43:31] **Dr Mike T Nelson:** It's wild. What was your top two or three favorite pre workouts of even things in the past or things that are available

[00:43:39] **Dr Matthew Stratton:** now?

[00:43:40] Okay. One that I liked for a long time was, I don't I honestly haven't looked to see current formulations or if they're around as much recently. I really liked Nutrex outlift at the time. I thought that had a really good blend that all said that three 50 PS science. It's made makes one blanking on the name, but I actually have it right now.

[00:44:03] Prolific. That's what it's called. Okay. I liked that one because it still had a decent amount, but it was also like it. It was the amount of time they sent you was enough for the typical, like 20, 30 servings, but the serving was two scoops. So it was a day that I didn't want to go too crazy with it.

[00:44:22] I could just do one scoop or if I was having a rough day, I could do the two scoop and the formulation was pretty good. Actually the best, this is when, you start to get, start to have problems when you start also ranking them by taste not necessarily like the one that I enjoyed taking the most, but I still, to this day, think back to the ones.

[00:44:41] That at the store. Cause we'd sit there and like everyone has the, like wine sifters and got a, your wine tasting. We had pre workout tastings. But night gats, nitro flex, black cherry, and then the bang master blaster, the lemonade one of that one was really good. Did those were the ones that I would go to the most thing that if I wanted to actually have another thing that I wanted a lower dose one.

[00:45:10] I used to like the pro subs Dr. Jekyll, because it was only 100 milligrams of caffeine. So still below. What you would typically say for that three to six milligrams, but it was found. It was enough to perk me up towards the end of the day, but not anything to like, go crazy. So I could still go to bed decently after taking it because I typically during that period of time in my life, I was training from nine to 11 o'clock at night.

[00:45:34] Oh, wow. Had to get up at 4. To go work my morning job and everything the next day. When it's on, that gave me a little bit, but not too much. But yeah, those are the main ones that kind of come to mind. I'm sure there's more that will come to me later. I'm like, ah, why didn't I say

[00:45:53] **Dr Mike T Nelson:** that?

[00:45:53] Did you ever try craze by DS nutrition? Were you around when that was out? Or is that before your time even?

[00:45:59] **Dr Matthew Stratton:** No, I saw it. We never carried it though. So I never tried it. Okay.

[00:46:04] **Dr Mike T Nelson:** It was. That's still probably my favorite. Although later it's come out that the compound in it is probably illegal and very, people say it was meth like and structure, but if you talk to any organic chemistry, that's a very loaded term, but it was very good for focusing, but it was not a super high STEM, but had like weird.

[00:46:31] I don't want to say side effects, but even main effects, I just started sweating profusely after I went naked. Not like I was hot or I felt temperature changes, but yeah, that was interesting. I think they've have isolated what the compound they put in there, which was not a extract from geranium.

[00:46:47] It was a completely manmade synthetic compound, but

[00:46:50] **Dr Matthew Stratton:** yeah, there's everyone I know in this space has like weird stories like that. I guess I still remember when I first started getting into this, there was a local supplement store down by the gym that I trained at and I got to know the Owner of it pretty well.

[00:47:03] And came in one day and he's we just got this new thermogenic and you got to try it. And I was like, all I was like, fine, I'll try it. I remember it still makes me laugh. Cause it was called poison. And,

[00:47:14] **Dr Mike T Nelson:** oh, I remember getting samples of that at the Arnold.

[00:47:17] **Dr Matthew Stratton:** Yeah. ALRI industry is poison. Yeah.

[00:47:20] And

[00:47:20] **Dr Mike T Nelson:** I just remember taking the skull on the front, like the black label in the background and stuff.

[00:47:25] **Dr Matthew Stratton:** And as we're taking it and then laying in my bed in my apartment, just with the room spinning, just sweating, just what did I

[00:47:34] **Dr Mike T Nelson:** just do?

[00:47:38] **Dr Matthew Stratton:** And then I learned if if I took it. And while I was fasted and didn't eat, then something like that would happen. But if I took an eighth and that wouldn't happen. So then I started anytime I took it, then I'd immediately eat afterwards. But as I was not eating great, so basically completely defeated the whole purpose of it because it was.

[00:47:59] A weight loss, thermogenic, and then immediately so that I didn't have some of the side effects, walk across the street to Del Taco and get a bunch of tacos.

[00:48:11] **Dr Mike T Nelson:** Yeah, I remember taking the twin fuel, the rip fuel, like back in the day when that was like the first one I ever tried. And, at the time it was hard to try to figure out how much caffeine was actually in it. And at the time I was doing my master's and I used to lift at seven o'clock at night.

[00:48:27] But most of my schedule, I didn't have class until nine. So I'd take that before I'd lift at seven at night, go live for an hour or two, and then end up like studying until three in the morning, crash for a few hours, get up later. But yeah, I think back now and go, Oh. It wasn't the best idea to take that at like almost 8 p.

[00:48:44] m. at night, but I guess if you stay up later, whatever, but yeah, definitely worked.

[00:48:48] **Dr Matthew Stratton:** It worked for you, yeah.

[00:48:49] **Dr Mike T Nelson:** Cool. So on the 16 and 8 fasting, what are your thoughts about one? Is it beneficial for body composition? And then the second part is, do you think that would be superior to other programs or do you think it's an equivalent option?

[00:49:07] **Dr Matthew Stratton:** For other programs, do you mean other diets or other fasting?

[00:49:11] **Dr Mike T Nelson:** Just other diets or other things, because my take on it is, I don't generally have people start there, but if I have people that I'm working with who have been doing it and who are successful, I tend to just leave them on it. I haven't read any literature that I think it's going to be completely detrimental.

[00:49:29] If somebody asked me personally, and this is a little bit more theoretical, there's not as much data on this, which one I would do, I would

probably say if you're really wanting to push body composition, I still favor a longer day of fasting and then other days having more protein, maybe having more neutral calories, but I can't say that's based off of any nice study.

[00:49:53] That's still very theoretical.

[00:49:56] **Dr Matthew Stratton:** Yeah. So in terms of things like body composition, at least with the data that we have out there has shown is pretty much what all these different protocols are doing is just tricking you into eating less. Yeah.

[00:50:10] **Dr Mike T Nelson:** Shocker. Physics still works. Yeah.

[00:50:12] **Dr Matthew Stratton:** Yeah. That's what I always say.

[00:50:14] Shocker. Laws of thermodynamics still work. And so especially in these free living situations where we tell people to just go start eating 16 and 8, whatever, on average people cut their calories by about 20%. So a pretty good deficit. That's pretty good. And there's a few studies suggest about. 500 to 550 calories in some instances.

[00:50:37] And that's around what, we typically might tell some people to cut their calories by when they're dieting. That's a

[00:50:45] **Dr Mike T Nelson:** theoretical loss of a pound a week, yeah.

[00:50:48] **Dr Matthew Stratton:** And so artificially without thinking about it, people are doing. Now in calorie controlled situations so far we haven't found actually a difference between something like a 16 and eight and just a normal day of eating.

[00:51:02] So like my thesis, for instance, this is the first calorie controlled. Study and we didn't find a difference now, granted, again, just because of some of the constraints that we were talking about earlier, it was only four weeks long. So within four weeks, we didn't see a difference. And that's one of the other things to consider is with all of these studies, some of the really, especially if we're looking at exercising populations, which, when people are dieting, we want them to be exercising as well.

[00:51:29] The longest studies out there are eight to 12 weeks. Yeah. But that's why even though I'm a big fan of intermittent fasting, I still am not going to say that everyone should fast or this is the thing that everyone should do or this is

the magic bullet or anything. It's just a... It's it's a tool that like, for instance, for me, like I like to use it versus when I don't really want to count calories, like when I'm traveling or something like that.

[00:51:57] But if I'm being good about tracking everything, then I'm not going to worry too much about fasting. But theoretically, yes, in an ideal world. I think especially if someone's trying to say, maintain as much muscle mass, having the more protein feedings throughout the day is probably going to be a little bit more ideal the more times that you can spike, muscle protein synthesis, blunt breakdown, which breakdown has already increased during deficits and all that kind of stuff.

[00:52:29] The nice thing is though, especially for fasting is so far. All of the studies, which granted it's to looking at does muscle protein breakdown actually really significantly increase to a point within some of these fasting window times that we see during time restricted eating. We don't really see that big of an increase.

[00:52:51] which is potentially one of the reasons why we see people are still able to maintain muscle while dieting as long, provided they're still eating enough protein. So that's also one of the big things is provide their eat enough protein because so far the only exercise study out there that has showed someone losing muscle mass, which was the Tinsley 2017 paper they were doing the 20 and four, but they only did 20 and four on days that they were not exercising.

[00:53:17] So on exercising days, they had the meat normally, and then did 24 they exercise three times a week and then did a 20 and four on non exercising days. But the group that did that, cause again, remember that particular paper was just, if we tell people to do this, how does their dietary practices change?

[00:53:31] Not necessarily trying to track certain tell them to eat certain ways. They, the group that was doing the 20 and four decrease their protein to about one gram. per kg. So well below the 1. 2 or 1. 4 basement, a lot of things would recommend. And so that's also one of the things, especially if you're working with individuals that are free living doing this and you're not telling them specific macronutrients to eat, there's specific amounts of macronutrients to remind them they might need to bias their meals towards protein because.

[00:54:05] the main macronutrient that we see that people like to cut out when they do these is protein, and that's going to lead to much worse body composition changes. And then in terms of just straight body composition so far

again, like we don't have any data to really suggest that a 16 and 8 is going to be better than a 20 and 4 or better than an 18 and 6.

[00:54:28] The only... Study close to that is the Seren Fuegos. I believe it was 2020 with the Seren Fuegos paper, which was a six hour feeding window versus a four hour feeding window. And again, it was a very short period of time. I believe it was about four to six weeks. But they did not find any differences between a six hour and a four hour.

[00:54:50] And a lot of times I like to, when working with people, I like to buy us a little bit closer to the longer feeding windows, just because that gives people more flexibility to put it in their life. And as opposed to someone sitting there going, okay, I can only eat for four hours. I need to make sure I'm around, food at this particular four hour.

[00:55:12] And if life happens and I'm busy during that period of time randomly, then I'm like SOL. So the longer feeding windows give people a little bit more opportunity to still fit their daily life into it a little bit better. And like you were saying, even with 16 and eight, that might not be where I'd like to start somebody.

[00:55:32] Because it's the don't think of a pink elephant, pink elephant, even though some people that might not be extreme of what they do naturally, as soon as you tell them they can't eat until noon, they're going to feel like it's a really long time starting off with some of these more some of the longer feeding window protocols, like the 14 and 10 or something like that.

[00:55:54] And then if they feel comfortable with it, start slowly increasing that fasting window. because while so far in terms of body composition, we haven't found any benefit. There again, there isn't great data on this, but there's theoretical data that the longer fasting windows may help for things like insulin sensitivity and that type of stuff.

[00:56:16] So if you're dealing with somebody that is really has some metabolic stuff going on, There's some theoretical reasons that some of those longer windows might be beneficial. But again, we need a lot more data on that to confirm or refute that. Because most of that right now is also in either very clinical populations.

[00:56:34] So only dealing with people with like pre diabetics, type 2 diabetes or animal data. And especially when fasting, animal data is really hard to transfer. Because. a 16 hour fast for a mice for a mouse because they're much

faster metabolism is very different than a 16 hour fast for a human and so especially when things like because in the intermittent fasting realm I hear people bring up things like autophagy all the time.

[00:57:01] Oh yeah. And we have And that's pretty much all coming from mice data. We don't really have that much data about autophagy in humans with the length of fast from time restricted eating. And but as people are extrapolating that from mice, we have to also keep that in mind, especially when we're looking at metabolic markers improvements of that.

[00:57:24] But we do have recently some the Sutton 2020 paper that showed some really interesting Differences in some insulin sensitivity, augmentation index and a few things like that in a six hour feeding window no grant that was one of the first ones to actually do what's called early time restricted feeding when she came out of Courtney Peterson's lab, who's done some.

[00:57:48] Good word with early time restricted feeding, which if people aren't aware, early time restricted feeding is basically time restricted eating. I use the two terms interchangeably. I know a lot of some researchers in my field get really

[00:58:06] I think as long as people know what you're referring to,

[00:58:09] **Dr Mike T Nelson:** as long as you define it, I think you're fine.

[00:58:11] **Dr Matthew Stratton:** But and just out of old habit, because when I started this, it was TRF. I still subconsciously sometimes revert to TRF instead of TRE, but they're essentially the same thing. They're the same thing.

[00:58:20] That's so instead of doing say a 16. And eight. I'm sorry, not a noon to 8 p. m. Feeding window. You move that window up a little bit. And so you might eat from, say 8 a. m. Until 4 p. m. Or something like that. So for instance, in that particular study, everyone finished eating by, I believe it was three o'clock.

[00:58:44] It was either two or three o'clock in the day. And but, and there's some, there's a couple really short studies. There's one study out of, A lab, I believe in Japan that I always blank on their name of the paper, just because I can't pronounce it very well. And that basically looked at early versus delayed time, restricted eating, which delayed is the version that vast majority of people are used to and looked at things like insulin responses to meals and found some potential benefit to the early time restricted feeding.

[00:59:16] But. The big question I always have to ask with that is, again, that may be great if there's some extra metabolic stuff going on there, but it, how realistic is to tell all of your patients or your clients or whomever, they need to be done eating by four o'clock in the day and they can't go home and have dinner with their kids.

[00:59:36] Yeah,

[00:59:37] **Dr Mike T Nelson:** that's. That's very hard. Like even with the 24, 24 hour fast, one of the pros of how I sell it is, take several weeks to work up to it, just doing it one day per week. And then even once you hit 24 hours, If you do that, say Sunday night to Monday night, you can still have dinner with your family both nights and they're like, Oh, okay, cool.

[00:59:57] **Dr Matthew Stratton:** Yeah, that's one of the, I know that's one of the reasons I, when I first started doing like eStopE and stuff like that, that worked well for me. Cause that's one of the things it's when I'm saying this, that I actually have participated in all of these. Different versions so that cause I think if you're going to study it, you should have some personal experience with it as well.

[01:00:20] And ironically, especially with fasting, most of it came before I was even like in research and stuff like that, but, spend a time, a fair bit of time doing alternate fasting, whole day fasting, TRE.

[01:00:34] The only one I haven't really done is my longest fast was 48 hours. I haven't really done the like 72 or something like that yet. So I don't study a ton of long term or periodic fasting. So I think I can make an argument for it.

[01:00:49] **Dr Mike T Nelson:** Yeah. Yeah. The longest I've gone is. 38 hours. And that was okay. At that point I probably could have gone longer.

[01:00:57] I was just like, I don't know, I'm just going to stop there.

[01:01:01] **Dr Matthew Stratton:** That is one of the interesting things that me and a few other fascinating researchers have talked about, but we haven't been able to set up a study to do this quite yet, but looking at hunger levels throughout it. Cause you, anyone I've talked to that's done some of those, we'll all say the same thing where there are certain, you reach a point where you're just not hungry anymore.

[01:01:20] And. Almost it's weird to say, but you forget that you're hungry. And then when you start eating again, that's when you realize you're hungry. So when you are around that, say 38, 36, 40, 48 hour fast or some psychologically be curious to see what's going on there. Cause most people, when they break their fast at that point, usually hear the same thing where they're like I wasn't like, I could have definitely done longer or like it hit a point where it wasn't too bad, but.

[01:01:49] I felt like I should or like it worked for the schedule or I only plan to go this long, that type of thing. But looking at like Tim, like Grant and I have talked about a couple of times trying to set up something to look at kind of some of those markers to see how quickly people adapt.

[01:02:05] Because that's also one of the other things to consider for a lot of people is when they first start doing some of these protocols. They're usually going to feel very hungry, but usually that should go away not too after not too long, some of the, we don't have great data on the timeline for that, but some of the current data shows about for most people about two ish, two ish to four weeks, you should start seeing some significant decreases in hunger during those fasting times.

[01:02:33] But if you've got somebody that's never done it before and then wants to jump straight in if as soon as you start telling yourself, I can't eat, I can't eat, I can't eat. Yeah. You're gonna, you're gonna be hungry.

[01:02:46] **Dr Mike T Nelson:** Do you think with the longer fast that you may be producing more ketone bodies and those may be having an appetite blunting effect?

[01:02:54] Or any thoughts on what do you think the mechanism

[01:02:56] **Dr Matthew Stratton:** is? I do think there's a couple of things I'd like with the ketones definitely because ketones by themselves do have do decrease appetite. We do have some pretty good data on that. And especially in those extended fasts ketone levels can get pretty high.

[01:03:12] Around that 36 to 48 hour mark is when we're seeing them start to approach some of the levels that you would actually see if somebody went on a ketogenic cell diet. Yeah. So

[01:03:21] **Dr Mike T Nelson:** around two millimolar, possibly higher.

[01:03:24] **Dr Matthew Stratton:** Yeah. And so that is definitely one of the things that could be going on. I'd be very interested to also look at some hormone, some stuff like peptide, YY, ghrelin, leptin those kinds of things.

[01:03:39] Cause we do, you do see inverse relationships when you start fasting, ghrelin, makes you hungry. Ghrelin initially starts to go up, but then that kind of most of the data we have hasn't actually been extended fully out. Tuesday, 48, 72 hours when looking at those hormones, unfortunately, we have some good fasting, acute fasting studies that have been taken out to 72 hours, but unfortunately they weren't looking, they were looking mostly at things like ketone bodies or something like that.

[01:04:10] And in ketone, insulin, glucose. Stuff like that, as opposed to leptin and ghrelin and all that. It would be interesting to see if there's any kind of phasic response where, say, like most things, where you see maybe a initial spike in ghrelin that starts to come back down and inversely related to leptin and all that, and leptin potentially going up after a certain period of time would be very interesting.

[01:04:34] But I think Currently, I think my best guess would be in relation to the ketones, like you mentioned. Yeah,

[01:04:40] **Dr Mike T Nelson:** awesome. Last question as we wrap up anything you can divulge on some of the breakfast studies, because I've looked at some of this literature, I haven't looked at it real recently, but Everyone's probably heard, breakfast is the most important meal of the day, and I know my bias is I love breakfast, I can eat breakfast almost every meal of the day per se.

[01:05:01] But then you see other data that says, no, if you skip breakfast, it was better, and the other data says, no, if you skip breakfast, you ate more later in the day, and then it was bad, and it just seems like it's all over the

[01:05:12] **Dr Matthew Stratton:** map. And you're not wrong. It is all over the map. Because like I was mentioning earlier, how intermittent fasting typically works is you people skip breakfast, right?

[01:05:21] And they cut their calories by about 20%. Because we have a couple studies suggesting that People will eat more the first meal after when they start eating again. So for instance, get breakfast, eat first time, eat his lunch. People will increase the amount of food that they eat at lunch, but they don't increase it enough to make up for the amount that they skipped for breakfast.

[01:05:46] And then the next meals, say dinner is back to what you would normally expect. That's what, but then you're heard. We do have a few studies, just. That say, Oh actually if you skip breakfast and people ate more the rest of the day and all that kind of stuff. But I would say considering all the stuff going on, all the intermittent fasting, which are coming out nowadays, I would bias a little bit more towards you skip breakfast.

[01:06:10] People don't make up the calories a little bit later. Then. In terms of performance what's again, that's very limited in terms of say how breakfast is say going to impact training, say later in the day, that was what my dissertation was about was what happens to afternoon training if you skip breakfast, but if you eat the same amount of food, so basically we had people come in and we gave them the same amount of food either at lunch or split up between breakfast and lunch.

[01:06:42] And then put them through a squat bench deadlift workout. And we didn't find any performance differences in that there is some data using so we were the only ones to do in resistance training. There's a little bit of data in cycling cyclists and rowers potentially suggesting Performance might be very slightly inhibited, but most of those inhibitions where you're looking at eight seconds on a time trial.

[01:07:08] But also keep in mind all those studies, again, like I was talking about the pre workout study that I did a long time did a while ago they were using time trials, so like races. So

[01:07:17] **Dr Mike T Nelson:** how long was a time trial they were using?

[01:07:20] **Dr Matthew Stratton:** One of them, so the it was a 25 kilometer time trial for the cycling.

[01:07:25] Okay. And which that study, I think that was the Metcalf paper, which resulted in about a 3.5 percent decrease, so which ended up being about 28 seconds. Okay. Versus the rowing paper, which was 2 kilometers. Yeah, 2K. That one ended up being an 8 second difference, which was a 0.8 percent difference.

[01:07:52] Yeah,

[01:07:53] **Dr Mike T Nelson:** which doesn't sound like a lot, but for someone who is rowing a 2k to improve their 2k, and you told me I could do something to shave 8 seconds off my 2k like today, I'd be all over that.

[01:08:07] **Dr Matthew Stratton:** And that's where I

[01:08:07] **Dr Mike T Nelson:** think it... That's why the context matters too. Yeah, the

[01:08:11] **Dr Matthew Stratton:** context is a big thing there where, one, we have to look at who is doing it.

[01:08:18] You're talking about an elite athlete where eight seconds could be the difference between, making the Olympics or watching from the couch at home. Yeah. Or like winning the Olympics and watch it from the counter couch at home, or are you talking about someone who just wants to go row a little bit after work to get some cardio in?

[01:08:38] Like to them, the eight seconds might not matter that much. And then two I think about okay, so what this also might tell me is on competition days. I might make sure to eat breakfast or something like that, but on a general training day where I'm doing where I'm it's sub max, as opposed to a full like time trial cause my dissertation, I really wanted it to be mimic close to a more normal training session.

[01:09:05] So we did like sub maximal work which is what vast majority of people, when they go to the gym are doing submaximal work. And so in that sub max. We might not see a difference. The other really interesting one, I think there are two big papers that kind of point to this is the mirrors 2018 in cycling.

[01:09:27] And then with resistance training, the Harvard in 2020 paper basically they came up with this interesting thing. It called it a viscous placebo. That's how they mentioned it in the paper, which is sounds funny to me, but basically they had. They had people either take like a placebo, which there was water and then a carbohydrate drink or this viscous placebo.

[01:09:48] So the viscous placebo, they basically tricked them into thinking that they were consuming calories. Like a

[01:09:53] **Dr Mike T Nelson:** soluble, insoluble fiber type mix of some form or something like that.

[01:09:57] **Dr Matthew Stratton:** Yeah. And and in this particular set, granted the. These two papers were looking at training fasted versus training fed, as opposed to how breakfast affects performance later in the day.

[01:10:11] And what they found is when they gave people those viscous placebo, actually there weren't any performance differences between the carbohydrate drink and viscous placebo. There were performance differences between those two groups in the water. Interesting. So with that potentially points towards that there's a large psychological component.

[01:10:32] Going on of people thinking oh, I haven't eaten as much today or I haven't eaten at all I should do worse on this and so i'm going to do

[01:10:41] **Dr Mike T Nelson:** worse. Yeah, so like a nocebo effect from it

[01:10:45] **Dr Matthew Stratton:** Yeah which also the other thing to keep in mind is all of those studies were conducted in individuals that habitually eat breakfast.

[01:10:54] Yeah,

[01:10:54] **Dr Mike T Nelson:** that's another part I've noticed too.

[01:10:56] **Dr Matthew Stratton:** Yeah, so our paper that we have under review right now is actually the first one to look at equal amounts of people who habitually consume breakfast and people who habitually skip breakfast. Nice. And so that's going to be interesting, but again, I think it would, the biggest thing that I found with it is if it's like competition day, race day, something like that.

[01:11:18] And I'm worrying about max all out performance. Like that, then breakfast might be beneficial. If it's just a general training session I'm just going to worry about having the person do what they can and what they can stick to. And then as long as the amount of food consumed before the training session is the same, then I'm happy.

[01:11:48] Because the only studies that looked at like later in the day that controlled for calories was ours and the Metcalf paper. And and the Metcalfe was cycling versus ours was lifted and so they were the one, Metcalfe did find that difference, but again, that was the 25 kilometer time trial, and then versus ours was four sets of squat, four sets of bench, four sets of deadlift at 80 percent of 1RM, and yeah, context matters a lot.

[01:12:21] That's the number one thing that I always try to in impugn into my students is that nothing is either always good or always bad. It's all about how you use it in the context of which is employed and who you're using it with and

all of that. So just like that, just like with that data or intermittent fasting data or anything in our field, that's the beauty of working.

[01:12:41] In applied science is that the correct answer is always it depends.

[01:12:46] **Dr Mike T Nelson:** Yeah. Yeah. And there does seem to be something about, I've done this on a couple of my clients several times where one guy in particular, his background carbohydrate intake at the time was like 350 grams per day. And that was a little bit lower for him.

[01:13:02] So we had him do a max row and I can't remember if it was, I think it was a 500 meter and we did it under the condition where he was just at his normal three 50, which was actually low for him. And the following week he did it with 100 grams higher. So I think we bumped him up to 450 or it might have even been 500 and we saw a difference of almost like 40 or 50 watts.

[01:13:24] And so we've repeated that with him a few times. And again, this is a complete all out, maximal test I've done that on a few other people too. And normally the higher acute intake does seem to translate to a better all out performance. But again, like you mentioned, how much of that is neurologic?

[01:13:41] How much of that is actually a physical power output? Who knows? Maybe those people are just better at using carbohydrates. And, but to me, it was not expected because if you would have asked me, I would have said, Oh man, he's got plenty of carbohydrates. In a short race, there's no way it's not dropping glycogen stores that much, but.

[01:14:00] I don't know. There seems to be something interesting about being in a caloric surplus. And then back to what you were saying about just even placebo stuff, which makes you think of the Mouthrin studies, where they're trying to figure out, okay, we did it with carbohydrate solution, you spit it out, and then we look at your performance, and then we did it with artificial sweeteners, and we've done it with water.

[01:14:20] And the best I can tell from any of those studies is that Maybe if your body is perceiving something sweet, that's thinking, like a feed forward mechanism, there's carbohydrates coming in so we can exercise a little bit harder, but. As far as I can tell from that literature, it's not super straightforward either.

[01:14:38] **Dr Matthew Stratton:** Yeah. And it's not, and there's even, it gets even more complicated when there's studies showing the improved performance but only when they had caffeine as well. Oh

[01:14:48] **Dr Mike T Nelson:** yeah. The caffeine makes, yeah that's even another, yeah.

[01:14:52] **Dr Matthew Stratton:** But but yeah, and that's also, I think another good point to come in talking about kind of the anecdotal experience there where To keep in mind like what true evidence based practice actually is individuals is remember in research, we're just reporting averages reporting means.

[01:15:08] And so we're saying on average, this is the type of thing that we see. So that's a good place to start, but then you need to adjust it with what your client. is displaying in order to help them the best and not just be like the literature says this. So even though I know that that, this is happening when we do this, but that goes against the literature.

[01:15:25] I'm not going to do that with you. And it's no if you're seeing that your person, that your client or patient or whomever responds in a certain way, then do that. Like your job is to help them not to be like this paper says this. All of the world must be like this.

[01:15:42] It's like the literature is there to help us try to understand things, but also know where to start and give us ideas of what direction to move in, but not absolutely 100 percent dictate how, what directions we move. So if you find your. Client does better with higher carbohydrate intake, even though the bout that they're doing shouldn't be super carbohydrate dominant and performance is the main thing that matters to them.

[01:16:10] Go do that.

[01:16:11] **Dr Mike T Nelson:** Yeah, I think I still listen to my buddy, Sean Casey, where it's research gives us the direction, but me search gives us the answer. So as a practitioner, you should know the research because that's going to help you probably narrow some stuff down and then, try it out and know what the limitations are of that.

[01:16:27] I also like, which I wish all studies would do this. It's gotten a lot better. Just show me what the raw data is of everybody in there. Don't just give me the summary stats. That's important. If I see some like super high standard

deviation, I don't see all the raw data. I'm starting to think, okay, why did some people respond better or worse?

[01:16:45] Or I remember years ago, Stu Phillips putting up this chart of. Muscular gains after I think it was a 12 week hypertrophy program. And he put up the scatterplot. Most people are in the middle. There's two guys like way up at the top. And there's one poor bastard who lost muscle technically during the study.

[01:17:05] And I'm like, that's fascinating, . Oh yeah.

[01:17:07] **Dr Matthew Stratton:** And sometimes that's really needed to improve the interpretation of it. And like the classic example of that, I think back is the 1983 finna paper, which was the first papers look at, at the keto paper. Yeah, the keto paper. Yeah. Cyclist where they found a benefit.

[01:17:26] for time to exhaustion at 63 percent of VO2 max, but it was all driven by one person because there were only five people in the study and it was all driven by one person that massively improved when the other two people stayed the exact same. The other two people massively decreased, but then the one person improved so, so much that.

[01:17:44] It made the averages show that there was improve in time to exhaustion.

[01:17:50] **Dr Mike T Nelson:** Yeah I specifically took a position presenting at a talk years ago because I knew Steve Finney was presenting. So I got to go to the dinner, hang out with them. And we're riding on the bus on the way back because that point always.

[01:18:04] And obviously, he did the study. So I asked him, I said, Hey, I'm not trying to be critical. I just want to know, what did you observe when you did it? Was there, something different about this guy? What was actually going on? He looked at me and he goes, yeah, I like walking my dogs.

[01:18:19] And then he like walked off. I'm like,

[01:18:22] **Dr Matthew Stratton:** what? He just

[01:18:26] **Dr Mike T Nelson:** didn't even acknowledge it all. And just removed himself from the conversation. I was like, okay.

[01:18:33] **Dr Matthew Stratton:** Okay Yeah, the only time I had any interaction with him, it was at the ACSM conference in Denver in 2017 because there was a really good symposium talk between Luis Burke, Trent Stellingworth, and him.

[01:18:50] Oh, nice. Sweet. And and to his credit, like he brought up that whole situation and everything about how the one person massively improved. And I think sometimes that paper, I think it's a little undue flack because if you read in the discussion, I think they do a pretty decent job of actually putting a lot of the results into context with that when a lot of people just like to harp on the one outlier.

[01:19:16] They talk about that a fair bit throughout the paper. But yeah, it was there was a similar thing with some people come and talk to him afterwards. And he was just like, Nope, I'm going this way.

[01:19:31] **Dr Mike T Nelson:** Cool stuff, man. Thank you for all your time today. I really appreciate it. And where can people find more about

[01:19:36] **Dr Matthew Stratton:** you? And so I am a assistant professor of exercise science at University of South Alabama. I do technically have social media. The only one that I actually use occasionally is Twitter, mostly just using that to try to find papers.

[01:19:51] So if you go to my feed on that, it's usually just a bunch of retweeted papers, because essentially as I see people post papers, I just retweet them so that when I have time, I can go back and read them. Yeah. But the easiest way to get con in contact with me is to email me. So it's just my name, Matthew stratton@southalabama.edu if anyone wants to talk or anything.

[01:20:15] But if you try to add me on Instagram or something like that, I check that maybe twice a year, . So if I, if you're not missing much, I don't respond if I don't respond to dms or. Don't accept your follow request or something like that. I'm not ignoring you. I'm not trying to throw shade or anything.

[01:20:31] I just probably haven't been on in four or five months. But the, yeah, the best way is going to be email me or just get in contact with me some way through the University of South Alabama. And are you

[01:20:42] **Dr Mike T Nelson:** looking for any grad students or any help with any projects coming up?

[01:20:46] **Dr Matthew Stratton:** Yeah. So we are we are going to be starting our doctoral program.

[01:20:51] **Dr Mike T Nelson:** Oh, nice. Very cool. I heard some rumblings about it, but I didn't know what was going on or the

[01:20:55] **Dr Matthew Stratton:** details So we have two students that are starting this fall. The first kind of big class is gonna be starting next fall. And if anyone's interested in supplements or fasting, especially when it has to do with exercise and stuff like that and look for a doc program, you can reach out and let me know.

[01:21:11] We are have a good master's program as well. Yeah. If anyone's looking to do some supplement and nutrition research and especially in the mobile area. So we're right by the Bay here in Alabama, which we got Florida and about 45 minutes, one direction. We got Mississippi and about 20 minutes.

[01:21:32] The other direction, we got new Orleans, two hours from here. We've got about 45 minutes. We got Atlanta about four hours. So pretty good, pretty nice location. You got the beach like 15, 20 minutes from here. Oh

[01:21:45] **Dr Mike T Nelson:** that's not bad. Exactly. Cool. Thank you so much for all your time. And especially thank you for all your research over the years.

[01:21:52] I know I've read a lot of it and it's been super helpful to, to see actual data on it, especially a lot of the other protocols. So thank you so much for all the work. Really appreciate it. Hey, thanks for having me. Thank you.

[01:22:06]

[01:22:07] **Dr Mike T Nelson:** Thank you so much for listening to the podcast. Really appreciate it. Huge thanks to Dr. Matthew Stratton for being on the podcast here and sharing all of his wealth of knowledge and especially for all the hard work he has put into doing.

[01:22:23] All of those studies, which are human studies that have been peer reviewed and published, which is no easy task. So a huge thanks to him. Make sure to check out his information, which we will attach to down below. And, yeah, if you like this podcast and someone you think may enjoy it, please forward it on to them.

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[01:23:25] Dwayne Jackson. You've got my buddies, Dr. Grant Tinsley and Dr. Eric Helms coming on and talk about body composition, measurement techniques, and a whole lot more. So stay tuned and we will talk to all of you next week.

[01:23:40] You know something? That was a sweet number. It sure was. You know something else? What? I hate sweet numbers!

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