

# FD Podcast ISSN recamp

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## SPEAKERS

Dr. Mike T Nelson



Dr. Mike T Nelson 00:01

Hey, what's going on? It's Dr. Mike T. Nelson here with the flex diet pod cast back once again. And today, if you are super nerdy into nutrition supplements, and even some exercise, a little bit of health, and especially the performance and body comp, I have a treat for you, as I was at the International Society of sports nutrition conference, just recently, June 10, through the 12th, in St. Petersburg, Florida. And I'm going to do a breakdown of many of the talks, I think that you will find interesting, I won't be able to get to all of them. And yeah, I think it'll be a good time, especially if you want the most cutting edge information. A lot of what was presented hasn't even been officially published in any literature yet. That's the beauty of going to in person conferences, which are going again now, which is awesome, is that you can get some brand new data that hasn't really seen the light of day with the exception of a presentation at a conference. So as always, this is brought to you by the flex diet podcast, go to flex the diet calm. If you want the latest on how to set up eight different interventions for better body composition and performance, all while increasing your health at the same time. Go to flex diet.com flexdt.com. Get on to the waitlist there. And we will notify you the next time that it opens. As of now looks like it's going to be mid July will be the next time that it opens. So go to flex diet calm. That'll also put you on the waitlist there when you go to getting on the waitlist. I mean that also puts you on the newsletter, you'll get all sorts of great information. If you enjoyed today's podcast, definitely get on to the newsletter. So as I mentioned, this will be a recap of the ISSN meeting. And it was amazing. It was super fun. It was great. I went down with Dr.

Lonnie Lowery and some of his students, I helped them a little bit with a poster, the students did really good. All the credit really goes to them for the work that they put in to doctrine, Lani Lowery, we can also hear us and coach Phil Stevens on iron radio, did a great job once again, mentoring undergrad students on how to do research. It's very common and a part of a master's program in most disciplines that you will need to publish your own research. Obviously, if you're doing a PhD, that's the whole point of the degree is how to publish and conduct studies. But an undergrad level, it's actually very rare. And it's even more rare to have students publish something alongside masters, PhD, and even PhDs at the same time. So we helped them do a study on caffeine, and coffee related to heart rate variability, which was awesome. The short kind of over simplified takeaway is that Starbucks via packets, those are more standardized for caffeine content, actually result in a little bit more parasympathetic tone as measured by heart rate variability. So parasympathetic tone is a little bit more rest and relaxation. Now, again, that's a little bit of an overview, I'll have a picture of the post or somewhere around here, I'll try to stick it into the notes, so you can read everything there. So shout out to the students who did a great job on that. So if we dive into some of the meeting here, the official notes are not yet quite up for members of the ISSN. And the future, they will have them on the ISSN website. So you'll be able to see everything, but I wanted to get this podcast out to you. As soon as possible. You have all the latest and greatest data. So this is from my personal notes. I tried to get as many details as I could, but due to the interest of time, and just my ability to write everything down. It's going to be partial. So if you do have questions, you can send a note to me, I will do my best to track them down and get an answer to you. But I won't be able to have every single detail for the studies. Even if I did that would probably be incredibly boring to listen to. So I want to get to you the highlights. And then if you have questions, I will do whatever I can to get you the information. And also as a shameless plug, I am a member of the International Society of sports nutrition I did. The sea is SN certification through them. They have the 19th annual conference will be at the expo in Fort Lauderdale, Florida, June 16 through the 18th 2022. So if you enjoy sports science, I would highly recommend that you check it out. If you enjoy more of the neuro sports angle, you can check for another podcast I did hear from the neuro sports conference that I attended. And that was, I'll find a way of linking it here. But you can look up the Society of neuro sports. Their third annual conference will be January 21, to the 22nd 2022. That'll be in Hollywood, Florida. So if you're looking for more of the neuro sport, a neural exercise component, definitely check that one out. I'm trying to hopefully I'll be there. And then if you're into more of the nutrition and sports supplement angle, check out the ISSN 19th annual conference, Fort Lauderdale, Florida, June 16, through the 18th 2022. So a huge thank you to all the members of the ISSN this year, for all the work that they did really appreciate it. Shout out to Eric moose diello, who always does a great job running around making sure everything is on track. Dr. Chad kirksey was helpful with the organization of the conference and the speakers. And then also the current president, Dr.

Tricia van dusseldorp. For all of her work, putting it together. It's a massive undertaking trying to herd that many cats to get it together. So huge thanks to them and Dr. Jose Antonio, everyone at the ISS and all the board members for making this possible. So the meeting started off on a Thursday. And unfortunately, I was not able to get there until a little bit later. I had the launch of the physiologic flexibility cert going on. I had some client stuff and some other deadlines for projects. I got down to Florida on Wednesday night, and literally just went to bed not too far long after I got there. And then got up super early at 5:15 in the morning, did my little morning routine meditation, and was working to try to get as much stuff done as I could before the conference. I did take a break to go to exercise at the lifetime fitness down there in Tampa, which was awesome. And then I was stuck at the chipolte a near the conference trying to get some last minute stuff done. So unfortunately due to that, I did miss a few of the presentations that started off on Thursday. Eric did one on registered dieticians, top pieces of advice for RDS and sports nutritionist. So I heard was great. There was a talk on nutrient timing, which goes beyond just looking at macro macros. But Patrick Hardy, Andrew wagaman did a presentation on energy status of collegiate athletes. And the literature on that usually shows that a lot of college athletes are way under reading. And then Dr. Guillermo Escalante did a great talk on the diet refeeds and diet breaks. I did get to chat with him a fair amount at one of the President's dinners on Saturday night, or Friday night, all the day's run together Friday night that I was invited to with Dr. Lonnie Lorina. But 12 other people, a great guy. I'm gonna try to get him on the podcast, he will be on iron radio coming up here to talk about kind of the life of a professional bodybuilder. It's kind of what we're looking at right now. But great information on that I did get to talk to him about it. There's sort of takeaway is the research right now is a pretty darn split. If I were to hedge a bet, I would say that diet breaks may not be as physiologically impactful as what we once believed. But I do think there is a role for them, even if it's more on the psychology side. Again, this is based on very limited data. But hopefully we'll have more on that in the future. We do have a little bit in here coming up talk that Dr. Bill Campbell gave So stay tuned for more information on that. Dr. Ralph Jaeger gave a great talk on gut health, our athletes different and what role can probiotics play in performance and recovery? Unfortunately, I got there just towards the tail end. But I didn't get the chance to talk to Ralph who always has really just super great information. I've known him through the ISSN for and probably over like a decade now. And one of the things he presented was, perhaps, we can look at probiotics in terms of increasing the amount of digested proteins, if we can give maybe a probiotic that increases, maybe essential amino acid availability, that might be more anabolic for athletes. And it does look like there may be some data intent in that area. The data was very preliminary but super interesting. We don't know. does that translate into longer term effects. But if it does, then maybe you will start seeing probiotics and all sorts of protein supplements. If I were to hazard another guess that would be my guess, going forward. Very interesting talk by Dr. Omar x XLR. Hopefully, I pronounced your name correctly,

they're viewing sports performance through the lens of evolutionary biology winner and loser effects and why runners get high. This was very interesting, he gave a similar talk at the neural sports conference. The takeaway from this is that there is a short term effect in different animals, and it looks like possibly in humans to on the winner effect. So they've done studies on I think it was fighting fish, and even fighting insects. And if the insect they have like these little battles that they have them do, had lost and goes into another fight, it appears that the competitor goes after them right away. And if the the insect of the little creature had one more, they seem to be a little bit more tentative, which I thought was super interesting. Now how they can figure that out? Or how do they know? Are they looking at some body posture position? I have no idea. But very interesting. So he was looking at some related information in professional athletes, they didn't really see a huge effect. But again, these are professional athletes. So you would imagine that part of your job as a professional athlete, is to make sure you can sort of buffer against that effect. They did some studies looking at doubleheaders in college baseball, if I remember right, and my notes are correct, it looks like there may be an effect there. But the effect was also very short term did not appear to last into the next day. So super interesting stuff. So look for more. Probably in the lay media, it'll be probably overblown about the winner effect. The next day, we kicked it off with Dr. Grant, Tinsley did an awesome talk on body composition assessment, and lack of certain standardization can wreck havoc. So you've probably heard me drone on a little bit in the past about the use of dexa for body comp, and how a lot of you know studies that have even peer reviewed haven't really standardized the protocol before having athletes to do a dexa or between tests. So just for some background, so dexa is dual X ray absorptivity was initially designed for body composition, not necessarily but for bone mineral density. So most of the time you hear it now at least in the sports world is talking about body comp. The original machines were more designed for bone mineral density, and have been adapted to body composition. Dr. Jordan moon gave a great talk many years ago at the ISSN that went into all the details of the pros and cons of this. But dexa for the most part is considered kind of, I'm putting my air quotes here gold standard for body composition. reason for this is it does appear to be quite accurate. Now again, when we say quite accurate, that's does not mean if you are a legit 16.1% that when you get an A dexa it's going to automatically read 16.1% there is some variability, even when you are standardized everything, the best that you can, just by the nature of the measurement, there is probably even more air comparing one dexa to the next, actually tried to find literature on that I can't really find much at all. So if you had a dexa scan, a year ago, on a different model from a different location, and you have one a year later, there may be a fair amount of variability between that because it's not only potentially different standardization. And even if you did standardize what you did beforehand, the different machine, it's different software, potentially different operators, though, that's probably not as big of an issue. So don't really freak out if that is you. And you see these massive differences, where I try to have a follow up measurement with the

same machine, if at all possible, if not, look at other metrics such as change in body weight, pictures, performance, etc. So Grant had some really great data that they did a new study looking at a four component body measure. So this is trying to take the best sub components of looking at body comp and put them together in a comprehensive model, which they have published data showing that it is quite good. And when they were looking at this, they wanted to kind of sort of compare the standardization before or between measures make a difference. You can imagine if you have a pre and a post condition, you could compare standardize to standardize, you could have your pre assessment be not standardized, but your post standardize, or you could flip flop that, or you can just be completely unstandardized across the board. Now you may be wondering, like why you would not do some type of standardization. The reason is, it's just convenience. So if you are trying to duck so let's say a whole college football team, it's gonna be harder and a lot more time and effort and staff etc. to have everything be standardized, especially if you're just trying to get into the ballpark. So normally, with standardization, we're looking at macronutrients. Because you have an association between body fat, and lean body mass, there's a bunch of different words that are kind of thrown around. muscle mass is not necessarily the same as lean body mass, but I will confess that I've kind of used those similarly, we also have probably more accurately what's called fat free mass. So most of the time, if you do what's called a two compartment model, you have your fat mass, and then your fat free mass, your fat free mass is literally everything that is not fat. So you can imagine if you have different amounts of carbohydrates, you're gonna have different amounts of muscle glycogen. And that can kind of skew some of your readings, or a fluid intake may affect some of it. If you drink a lot, say a bunch of water, that is body weight, but it's not necessarily fat mass. So that would count towards in general fat free mass. But it's not really a fat free mass, it's a temporary thing. So that's why standardization is needed. What they did was they used also compared different measurements across different systems, they used an inbody. They use dEXA, they used Bod Pod also. So if we take all of this together, I'll just give you some of the high points here. If they did not standardize the post, they saw an increase of about 1.4 kg of fat free mass. Now the tricky part here is comparing is this real versus not. But if we compare that to the unstandardized, pre and post, they saw about four kilogram difference. So there is some differences. Do you standardize or do you not standardize? The big grand takeaway, though, was standardization did not have nearly as big effect as what the researchers thought that it would. I can't remember it didn't have a note here on the exact stats of what the difference was, again, they will publish all of this data. But that was kind of surprising to me. I know I've been probably maybe unfairly and right retrospect critical of dEXA. So we have some new data to show that maybe it's not as critical to be standardized as we thought. Now again, if you are an individual, and you were looking at small changes, right, because even adding lean body mass or fat free mass, that's a very long term process. And if you are plus or minus one or two pounds to

you as an individual, that's kind of a big deal. But I do think, as an individual standardization is still the best way to go. Do the same macronutrients the day before, do not train the day before. And then ideally, have the measurement done in the morning. And they'll do what's called a dry fast overnight, once you go to bed, do not consume any fluids, until after you've had the dexa scan, in a perfect world would be the same scanner, same time, same software, same location. So you're trying to minimize as many differences there as you can. However, if you're in charge of, let's say, the college football theme, and you have a choice between bod pod, or maybe a cheaper form of Ba, or dexa dexa is probably going to be your best bet, and does not appear to be as affected by on standardization, as we thought was also cool. And I hope they published a little bit more data on this, too, is a group that they took was group of 19 subjects. And for six weeks, they trained three days per week, and actually put them on a hyper caloric diet with the goal of gaining one pound per week. And they averaged around 3800 kilocalories per day. So this would be I think, an interesting study to look at just what were some of the changes that they saw, because of those parameters using their four component model, both pre and post. Again, it was relatively short period, it was six weeks. But I think that data, once it comes out, will be super interesting. So there's some things you can do for body comp and good practice for dexa. Another history one was by Brandon Roberts, effects of n sets on the muscle and bone from cell to soldiers. So he was looking at this as part of some Army Research. Again, he was at the dinner on Friday night, so I got to talk to him a fair amount and I got to sit next to him. Really great guy, super interesting study when they were looking at the use of incense, so common incense are going to be like Advil, naproxen. These have an analgesic, so a pain killing effect. And there's some interesting data that they may change rates of muscle hypertrophy. The data is relatively, I'd say kind of split. In animal studies, it's pretty conclusive. But we're not all the same physiology as rats. And some of the data shows that high use events ads may blunt some of the muscle hypertrophy effects in humans. If you contrast that to the real world, though, you do you find some very large mammals who have used high amounts of insects and doesn't really appear anecdotally to affect them. If you look also at older populations, I can look up some of Dr. trapeze work. They've published showing that insects and older population may actually be mildly anabolic, meaning they might be helpful. Other theories on this is potentially differences in inflammation in younger people versus older people. But Brian Roberts was citing some internal data they had in terms of prescriptions for use of n sets in the military. The active army populations that they looked at was around 82% compared to only about 12% in the general population. So they have a high amount of use. As you know n sets tend to block some of the Cox enzymes. These are cyclo oxygenase enzymes, especially the form one and two. There are other forms of these drugs that can more selectively Bach, either the Cox one or the Cox two. They were looking to see Was there any difference between those on possibly rates of healing In general, what they found was that standard inserts, at least on some of the preliminary

data cell culture did not show huge different effects. Again, they're doing a much more acute human subject study that'll be coming out this fall. So they may have more information on that. They did find, however, that a particular form at high doses was more toxic to muscle cells. And I believe that was one that blocks the Cox one enzyme specifically, again, that's a drug that's not nearly as common. And if I remember correctly, it was an in vitro study. Yes, it was in a cell culture. And it was pretty high dose, but it was something that was still high enough you could see in humans, so more data to come out on that. I think the future we'll be looking at specifically Cox, one versus Cox two drugs is one potentially more toxic to muscle than another. As a takeaway, he mentioned that there is some interesting data on tart cherry juice that may help soreness and inflammation and does not appear to affect changes in muscle hypertrophy. So as a short primer, remember that actually having some increased what's called Ross reactive oxygen species, a little bit of local inflammation appears to be needed for the remodeling effects for hypertrophy, and maybe even strength. So we don't want to blunt those effects completely. How much of an effective we need is still kind of up for debate. So more interesting stuff coming out on that. Dr. Katie Hirsch did a great talk on high intensity interval training and essential amino acid supplementation. So for this one, they used high intensity interval training. They did 10 rounds for one minute, at a 90% of their Max, I believe they used bike for this. And they've presented earlier data showing that high intensity interval training can actually add lean body mass and under trained individuals. Dr. Martin Gabala has published a lot of data on that. Again, that is an untrained individuals. They talked about Dr. Stu Phillips has shown the muscle protein synthesis and resistance exercise using hit that increases it for about 24 to 48 hours post. I don't remember if that was in untrained individuals or not. So if you do high intensity interval training, that is much closer to strength training than kind of standard cardiovascular or aerobic training. So they looked at a study that was 66 people average age 36 years old, they were a little bit more on the sedentary overweight status. And then we're investigating high intensity interval training and essential amino acids. They did not see any RMR changes in terms of resting metabolic rate, they did see an increase in the high intensity interval training and vo to Max, right so the volume of oxygen you can run through your system. And that's supported by other data showing that an untrained people high intensity interval do help with that. They did show a drop and our er. So this is a way on a metabolic cart that you can measure how much fat versus carbohydrate somebody is using. So if you see a lower rvr, so respiratory exchange ratio, it's looking at the ratio between your oxygen and carbon dioxide. If that number is lower, usually closer to point seven, that shows that your body is using more fat at rest. And that's what they saw here they saw a drop in our er, which indicates at rest your body is using more fat. However, in terms of body comp, they did not see any change in body fat. Again, I don't believe that they did anything with calories per se though. No changes in fat free mass. They did do dexta of whole body. And they did see a little bit of change in the thigh in

terms of lean body mass increase. Again, I believe they use biking or cycling with this. Yep, they did. So you would expect the maybe lower body may see an increase in lean body mass. But overall, I would not expect to see much change in the arms. This was shown by an increase in the vastus muscle cross sectional area at the end of eight weeks. They did see a whole body a turnover rate of proteins were better with essential amino acids which they He said was better muscle quality. What exactly is muscle quality is a little bit debatable in the literature. And what was interesting about the intervention they did is they had the very last round of 10, they did to exhaustion so they could look to see Was there any type of performance changes to the dose of essential amino acid was twice per day at 3.6 grams. This was given 30 minutes pretty in 30 minutes post. And this was done for a total of eight weeks. And checking my notes here to see if I have anything else on that study of what else they found. Yeah, so if I remember correctly, it wasn't a huge difference between the groups on that. But again, I would have to go back and double check. So yeah, though the changes in RMR no changes increase in vo, two Max, the drop and rvr. And no change in body fat was both for the group that just did the high intensity interval work. And the group that high intensity interval training with essential amino acids. So you could argue that the inclusion of essential amino acids here did not have any effect. Again, the dosing on that is relatively low. So I would be kind of surprised if it did show an effect. You could argue maybe bumping up the dose would be beneficial. But that does kind of match my bias that the biggest thing is training quality. If you get a high enough quality stimulus, especially in untrained people, you're probably going to see some benefit. Now, again, that doesn't mean nutrition can't be beneficial. But you're probably going to need to see changes in calories, and potentially overall protein. The reason for using essential amino acids here is that they're trying to make something that's an intervention you can do that's reasonable for people who are also untrained. So if they did see that it moved the needle a lot, you could easily have someone consume essential amino acids, pre and post training, they don't really upset your stomach, there's not a lot of volume, you can get by with putting them in a very small amount of fluid. So if it was positive, that would be pretty cool. And something that may, again, move the needle quite a bit. For people who are not necessarily trained and are still working on those habits. Either you can make an intervention for people to do more likely they are going to do it. All right, so I'm gonna skip ahead a few talks here because I was kind of in and out for a lot of the other talks in between. And next one is by Dr. Gabriel Sanders workload and neurologic performance and D one anaerobic athletes. Really interesting talk, he gave a talk at the neuro sports conference also. And they've done some very interesting stuff by trying to monitor a lot of their performance in their team sports. They're everything from the polar heart rate system to the catapult system that measures acceleration, deceleration GPS, just a whole host of parameters. My buddy, Dr. Ben Peterson used to work for them for a while. So I've been able to talk with him in the past about it really fascinating system. And what they saw was, ideally, the athletes who had the best

performance and a minimal changes over the season, especially in bodyweight, and I thought this was really fascinating. So something that's really simple. If you don't have money for Team monitoring, get them a scale and have them step on the scale each day. And there's new systems that will allow you to almost import it directly. I use a software called chronometer. So I have my online clients. I've been doing this for with them specifically about five years, I found a huge use of just daily bodyweight. The reason I went to daily bodyweight was if I did a measurement, say Sunday night, at the end of the day, it's going to be too variable. So I would want to do it in the morning. If their check in was say Mondays, they may get on the scale Monday morning, because of maybe some changes they made in their weekend. That single point may not be necessarily representative of where they were at. So I like them just to use the bathroom in the morning, get on the scale and just log it. So that we have, we're gonna have a daily measurement, and it's gonna be fairly accurate. Of course, it's not telling us body calm, but we can look at the trends over time. And it's gonna be less volatile based on just a single measurement every seven days. And what they showed here is that athletes over the course of a season, they had a greater view to max and they also had minimal weight changes a bodyweight. So you can just plug in the data by hand and the chronometer has a bunch of other ways you could get it. And so remotely, you can do this with athletes, or if they come in every day, you can standardize it to when they come into the facility. Either way, I thought that was very interesting. Something that does not take a lot of technology, I think is dramatically underused, used as monitoring strategy. We did ask them about did they use heart rate variability, they did not just because they had to draw the line somewhere with all the technology they were using. And the last part here is that for nutrition, education in terms of an intervention to do with athletes, he said the best thing that they did was literally take them grocery shopping, which doesn't again, cost you very much money or no money at all, and just educate them about, you know, the difference in nutrition and fueling, he said, that made a profound difference. They did it as a team. So again, like my takeaways with that is, yeah, there's some very interesting stuff they presented with workload and nutrition and neurology changes. And there's definitely a place for that, I think it's super useful. But for two things that don't require really, or very minimal technology, again, that can have an effect, especially on team sports. bodyweight daily, and taking your team to the grocery store, to educate them about nutrition. So you've ever worked with college athletes, or even very high level college athletes, or even some professional athletes? The data I've seen just on a personal level for those athletes that I've worked with in those settings. Sometimes it's really good. A couple, let's say hi, run MLB and NHL players that I've worked with really, really good. Few, absolutely, utterly horrible. The first time I saw some nutrition from two very high end, probably one of the top, usually within the top five female track athletes at the time in college, I thought the coach was playing some joke on me, it was a lot of fast food, they were dramatically under reading. And turns out, it wasn't a joke. That's actually what they

were doing. And they were still running very fast. So don't assume that just because they are a high level athlete that their nutrition is on point, many, many times it is not again, education, going to be the first place to start with that. The next step, we had a good buddy, Dr. Bill Campbell, rapid fat loss, how fast is too fast, since it's one of his graduate students, Alexander Brooks. And we all know that the issue is if you lose fat or weight too fast, you can definitely lose muscle. I felt there's stuff in the book from CRC Press, dietary protein and resistance exercise. And I reviewed some of the studies showing that especially if you have a low protein intake, that you are going to lose lean body mass. If you are heavy weight training, you may lose less. I think that's a little bit debatable. But if you slashed your calories by 40 to 60%, overnight, you stay around the the RGA protein, which is around 60 grams total per day, which is very low for athletes. And you do that you potentially are going to lose lean body mass all the studies so far would say yes. Now if you add strength training to that, I think you may be able to keep some of that muscle, but you're definitely not doing yourself any favors. So what they did was a six week study. They had two weeks before they had kind of like a maintenance phase. They did two weeks of an aggressive diet. And then they had two weeks of them just walking around kind of free living. Again very short study but again, super interesting to see they did not make any changes to Their training. These were people 18 to 49 years old, they had been resistance training greater than six months. Although he said most of them had been doing it quite longer than that. They've been doing a minimum of two sessions per week. So, six weeks, they met with someone who monitored their training. So they had assigned to them online and in person guide or coach, they also had a nutrition coach. So they had to do a daily check ins. So they did everything they possibly could to ensure compliance. And to get the most accurate data that they could, which I think is really good. Because self report data is kind of a big downside to a lot of those studies. They had two groups, the linear group, which for that two week period, they just cut their calories by 37%. Every day, they had the nonlinear group, or week one, they slashed their calories by 50%. And then week two only by 25%. And both groups lost or I should say both groups had a reduction in the same amount of calories. They just had the linear group which was 37% reduction over those two weeks. And then the nonlinear group were week one, they cut them by 50%. week two, they cut it by 25%. They had them on a high protein diet. So about one gram per pound of body weight, using about 60% carbs and 40% fat was the rest of the diet. So post diet after that two week period, they were free living. So no instructions just go about your daily life have, you know what you're going to do? pre measure, they made sure they had no exercise for 24 hours. They did a dry fast overnight. They measured RMR, right, so resting metabolic rate, and body fat. Well, they found what the results was that adherence was really good actually was very, very good. Body comp, they lost about three pounds during the two week phase. What was interesting is after the two weeks where they went back to their normal life, they were not given any other instructions, they kept about 50% of it off. Now that to me was surprising. I would have

expected by the end of those two weeks that they would have been back to normal again. But that was not true. So some interesting data that maybe for short periods of time, maybe being a little bit more aggressive is okay. They lost about 1.2% body fat again, and they kept this most of the time. His goal for back of the envelope calculation, he recommends if people are already relatively lean, losing about 1% body fat per month is good. So I thought that was another key takeaway. So they lost about 2.2 pounds of fat mass and kept it there. For the most part. Now again, this is talking about averages. And where they were at. Two thirds of it was fat or was fat and 1/3 was lean body mass. So at first blush, you're like, oh, wait a minute, they were losing fat, the most of them kept some of the fat off. But if two thirds of what they lost was fat, and the third was lean body mass over just two weeks, that does not seem ideal, right. Because you are losing lean body mass, you are not going to gain that much lean body mass in two weeks, it's going to take you a while to add that back. However, when they adjusted for total body water, they use the three compartment model. They found that the dry fat free mass loss was only about point one kilogram. So in English what this means from nerd speak is that they did lose some water loss. And the machines detected that as a loss of lean body mass. So it turns out once they made this correction for a loss of body water, the real quote unquote dry fat free mass loss was only about point one kilogram, so really nothing to write home about. So they did not appear in this short term study to lose much of any lean body mass. So I thought that was also super interesting. So in terms of RMR resting metabolic rate after the two weeks it went down about 5.5%, which really not that much of a difference, I would argue that that may just be even in the machines, even though they did everything they can to minimize those changes. However, after the two weeks of going back to normal, there was a trend, which means maybe it was still about 2.6%, lower. Now, again, a trend means that it didn't reach the statistical significance. So we don't know if we added more people to the study to increase the statistical power, would that really stay? Or would it change? So again, some data that yes, your resting RMR may drop a little bit. But to me, that's not super surprising, and it's not anything I would be extremely worried about. Again, you don't really want to lose resting metabolic rate. But from other research and stuff that I've seen, I think it's more resistant to changes than what we believe. So again, big shout out to Dr. Bill Campbell, and everyone on his staff. They're really, really fascinating stuff to look and see if you are a little bit more aggressive. Does it make a difference in body composition? Again, all like standard caveats apply? It's one study, it's of a short nature. We don't know what happens if you repeat this, we don't know what happens if you get more aggressive, or if you go longer than two weeks. So it was very careful to point out that this does not mean that everyone should be doing crazy, two week cutting phases. But again, in a worst case scenario, still some super interesting data. Next up was a talk from Dr. Mike Roberts, who I always enjoy talking to him. I got to talk to him on a poster session, next to Dr. Lane Norton, and some other guys for a while. And yeah, so the super interesting, the great part about going to these meetings is you get to

talk to the actual researchers themselves, which is wonderful. You get to ask them particular questions. Because it's all it's all very much when you get down to this level of being in the weeds. There are differences, I think that can be hard to appreciate with it. So shout out to him. Also, James Longstone was there. They did a poster, which was again, super interesting, too. So Dr. Mike Roberts talk was looking at muscle hypertrophy. The big takeaway here is I actually felt better after this talk, even though it was a lot of data saying, Hmm, maybe we're not entirely sure what's happening with with muscle hypertrophy. But I felt a little better that reading some of the research that I get really confused. He pointed out that the myofibrils, they have this really interesting lattice structure and that they're highly interconnected. They're not this nice, smooth, parallel picture that we always thought that they were. This is from some new data using 3d imaging. And there's also some new data looking at female versus male response, how that might be different. How the mitochondria lineup around the muscle cells is even different than what we thought. Some interesting data, they're showing that resistance training, looking at changes in methylation, did result in more was called de methylated mitochondria. This is a signal for an increase in biogenesis. So making more mitochondria. And if you think about it, this makes sense, right muscle needs to have ATP needs to take oxygen and form ATP. So having changes in mitochondria with certain types of resistance training kind of makes sense. They talked about some rats where they did what's called a synergistic ablation. In the little bottom part of the leg, they'll cut one of the muscles to overload the other muscle all of the time. And they saw some changes in some of the type two fibers only. And this gets into izar data on what's called the mile nuclear domain theory that you need a nucleus. And it can only sort of govern a set amount of space. Some of the data previous says that Yes, that is true. So to get more muscle at some point, tune need to add more of these myonuclei some of the newer data analysis, maybe not so much. So maybe that's potentially changing. Very interesting data on looking at the microtubules that run through the muscle cellular structure itself. things related to it's called extracellular matrix, which he said is probably going to be the next frontier looking at muscle hypertrophy. So you've probably been a little bit too over focused on the actual sort of actin and myosin and the fibers themselves, but looking at what are all the other components that go into the muscle itself. Luke van loons lab has been looking at capitalization related to that. And if you have more capillaries in the muscle, you can get more muscle itself. That kind of fits with what I've noticed some people who have a low vo two Max, that they can't necessarily have, or should say, have a harder time adding more muscle, I think that may be related to getting energy into the system at an appropriate rate. I also talked about myofibrils splitting nests or after very heavy work. This was what they saw on em. And again, I think that might have been Dr. Darren, who was talking about that. But really interesting talk. Again, I got to talk to him for quite a while. And yeah, the takeaway is, yep, in terms of things we know that drive muscle hypertrophy, lift heavy, more calories, more protein, more volume. Outside of that what is actually going

on, I think is probably still up for debate. What I would add to it is testing your VO<sub>2</sub> to Max, making sure you're at least in the 50 to 75th percent of the population data. Again, not necessarily people who are lifting. But I think if you're in that higher power compared to general population, just anecdotally, I find that people's response is quite a bit better. Again, there's not a lot of direct literature to support that. But it makes sense that you need to convert ATP to get energy. And if that is occurring at a lower rate, maybe that is potentially a rate limiter. And next up, we had Dr. Matthew Stratton is the clock, your greatest ally and evaluation of current intermittent fasting literature. So he did a really great review on just the explosion in the research on intermittent fasting. Yeah, so the terms even intermittent fasting, there's all sorts of different terms, we can look at feeding versus fasting windows. And that's the generalization of how I think viewing intermittent fasting is going to be best. Now, keep in mind that and he pointed this out quite a bit, that what you eat during the fasting window, by vast majority of studies is not specified. So I think that will probably change in future research. There's also different types of fasting, I go over all of this in the shameless plug for the flex diet certification. I'm personally I'm a fan of fasting but done in very controlled and specific ways for certain populations. There's also alternate day fasting, there's periodic fasting, which is one to two times a week, there's time restricted feeding, which has now probably been changed to time restricted eating, or TRF. There is some early data showing intermittent fasting better glucose utilization, and that there may be some fat mass lost on average eight to 12 weeks, losing about three to five kilograms that can be lost. Again, usually with that you're gonna see around a 20% reduction in total calories loss with intermittent fasting. Again, that gets super messy because there's all different types of intermittent fasting. He did a really nice review of some of the studies. One of them was moral at all 2016 they did a 16/8 approach to fasting. They had 34 people in the studies, they had done five years of resistance training. They attempted to be ISO caloric with higher protein. At the end, they did gain some fat free mass and some of the people, the fat mass and the time restricted feeding, they did lose fat mass. And then the interesting is that they tried to keep them isocaloric. So again, this study wasn't necessarily looking at body composition changes. But he pointed out that, despite them trying to keep the iso caloric, the time restricted feeding, which again was a 16/8 approach 16 hours of fasting with an eight hour eating window each day, that the time restricted fasting or eating, they did lose some body fat. Another one was Tinsley, which you may notice as a grant Tinsley, 2016 at all, there was 24 people that are greater than one year of resistance training was interesting as this was actually all females. Again, they did a TRF approach of a 16/8, and they had high protein. So the goal was actually body recap, not necessarily weight loss. They attempted to do this by a reduction of 250k Cal's per day. And they did use a self report diet records. What they found was that fat mass and the time restricted feeding window that they did lose fat mass. Another study this was from Stratton, so the presenter 32, males greater than six months resistance training 16/8, versus a control group.

Both got a 25% reduction in calories. And the goal here was fat loss. But they did not see any difference in fat, mass, fat free mass or body fat percentage. Now keep in mind, I believe in this study, both groups saw 25% reduction in calories. So some data to show that if you can control calories, once again, we don't see dramatic differences. So hold on to that theme. Another one was Tensley 2017, time restricted feeding. They were let's see training, I think four days per week, or three days a resistance train, and the TRF group, eight 650k Cal's per day less. And a BA flipping through my notes here to make sure. And then they compared that to a normal diet. So TRF, they saw last but no significant changes. But there was a trend for an increase in fat free mass on the normal diet, and a decrease in fat mass for the time restricted feeding. Again, no difference in performance and any of those groups. So my kind of bias takeaway from this is that I think there is a role for time restricted feeding, it appears that if you control calories, you're probably not going to see a huge difference. Now again, these studies that were quoted here were all resistance training, generally very healthy individuals. Anecdotally, I have had people do a 16, eight, and they usually came to me doing that first. And they've been pretty good. They've been happy with their results. My bias is if someone comes in, I generally don't do a lot of the 16 eight, although someone is very busy, their schedule is just kind of a nightmare, then I think it is a possibility. As in the flextight cert, I generally like if people use a fasting approach to slowly work up to one day of 19 to 24 hours and do a fast. But again, super interesting data, I was nice to see an outline of some of the work that has been done, especially the inclusion of resistance training. So a lot of fasting studies do not employ any resistance type training in it. I think we will be seeing more of this in the future. Unfortunately, I know there's some other data that due to COVID kind of got crushed in terms of a big trial looking at the 16 eight approach. I don't know if they'll be able to salvage any data from that, again, that was not from this group was from a different group. But stay tuned for more information. I think fasting definitely can be an appropriate thing to use. It just depends upon what are your preferences and what do you like if you're controlling calories. probably not going to see a significant difference. But maybe we'll we'll find some other markers in health will change. And I do think that's going to be different if you're looking at a healthy resistance training population versus a general population. And next up was Dr. David church talking about essential amino acids and protein synthesis. Really, really good stuff. The short version here is that essential amino acids will show up in the bloodstream and the plasma much faster than even whey protein. This begs the question, do they stimulate what's called MPs, muscle protein synthetic response? They do, and does the speed of how they show up matter. That probably, we're not sure, I would say maybe, but not sure. The other part is that these are all done generally as an overnight fast because they need to, because of the tracer and the stabilized approach that they use, they need to have kind of a steady state of the amino acid pool. So trying to do them in a Fed state is very, very tricky. So again, this would be overnight in a fasted condition. He pointed out something which I think is

overlooked, and I'm probably guilty of overlooking this myself is that we tend to look only at muscle protein response. And we tend to poopoo kind of whole body's synthesis response. And the whole body synthesis response is important. Because if you have all these other greedy organs, taking up your amino acids, and you are not providing them via the diet, they are going to come from muscle, right, because muscle is stored amino acids. So full body protein synthesis is good, then we can look to see where amino acids are coming from. So the takeaway there is we don't want muscle to be giving up amino acids to run different parts of the body. So I think again, going back and zooming out and looking at the body as a whole organism. And looking specifically at what happens in muscle is still important. But we need to keep in context, what is going on with the entire body and the whole protein synthetic response with that. The details also, someone asked him a question then about if you are going to use essential amino acids. This is just taking more and more better. I know I've quoted some early work showing that six grams of essential amino acids was pretty effective. He said that from their lab, I think already Fernando has done some of this work to that the max essential amino acid dose was around 15 grams. So when they went above that, they did not see a better acute response and muscle protein synthesis. Now again, these are all acute responses, which do give us some insight into what's going on with muscle tissue. Again, it does not necessarily scale linearly, meaning that if you took a dose of six grams of essential amino acids, are you going to get twice the amount of muscle growth with a 15 gram dose of essential amino acids? We have no idea to the answer to that question. I would say it's probably not going to be twice as good, maybe a little better would be my pure guess. And again, we don't have much data on that. So my practical takeaway from this is, I've used essential amino acids more recently with collagen in people training, especially doing some rehab, rehab, whatever work you want to associate with in the morning. reason for that, especially if they don't like to eat until later. I know that I'm going to see an increase in plasma levels. And I know that that's going to translate acutely into adding more amino acids to muscle tissue. I don't know exactly how much muscle that will add. But there's not much of a downside other than cost. And then I will add 15 grams of collagen to that. Some work from Dr. Keith bar Dr. Shaw, showing that taken 40 to 60 minutes before exercise with a small amount of vitamin C may result in better soft tissue function. We've been doing that with athletes now probably about two and a half years and totally recovery in tissue Healing appears to be better. But again, anecdotal hard to say. Not much of a downside to that. So if there's some lifts or something you're really trying to work on or an area that you want to see a little more progress, maybe doing a couple sets of that in the morning, about an hour after essential amino acids and collagen. Right now, I'm still using about 10 grams of essential amino acids, mostly just due to cost and being realistic. 15 grams of hydrolyzed collagen. Next up, let's see, we had that was Dr. David church. And this was interesting. This is from Brandon Willingham. betaine supplement on fluid balance and thermal regulation in the heat. So this is a betaine, b e, t, a I I and I I, sometimes known as

TMG, trimethyl glycine. And what they were looking at with that is cycling in the heat does betaine is it beneficial for that? The short answer is maybe the data they had was not super compelling. But they used a pretty high dose, I was able to figure out what the dose was as 100 milligrams per kg, and it was twice per day. There is some other data they quoted that it may increase plasma volume may work on the Heat Shock Protein 70, or HSP 70 pathway. But the data they had said, Yeah, didn't really show any effect. But again, it was a smaller, early study, something I thought was a very neat and novel use that we may see more data in the future. So keep an eye out for betaine or TMG. Especially if you have endurance athletes in the heat. I'm also going to try it with athletes who are going to go to altitude. Anything that I think I can increase, potentially their plasma volume should be beneficial. If you want to learn more about carbon dioxide oxygen, I go into way more depth on this in the physiologic flexibility, certification with think I've got five plus hours on oxygen, carbon dioxide, breathing, we've talked a lot about altitude effects, what you can do breath holds all that kind of stuff. So look at physiologic flexibility calm. Next was Alyssa olynk. He was looking at high intensity interval training related to metabolic flexibility. So one of my favorite topics of course. And they were using h i t. so high intensity interval training as a way to look at metabolic flexibility. So switching of fuel sources, and then they also did this comparing them with a high fat meal challenge. And in short, what they saw was if you had a lower fitness status, this was correlated with a lower amount of fat use. Now again, I know I just dramatically overly simplified an entire study in like three years or four years of her life's work. But that does kind of match other data that we've seen of vo two max being associated to fat use. So if you have a very low vo two Max, odds are your ability to use fat is also going to be lower. So doing some work to build up the size of your aerobic engine is going to be beneficial. We also had a talk from Haley Mayer. She does want to Dr. Lonnie Lowry students does coffee consumption acutely hamper heart rate variability in habituated you know university students. What they saw was a hinted at this at the beginning that acute heart rate variability actually increased after consumption of via coffee. So via the instant Starbucks brand. The reason they use that is because the caffeine amount in it is actually quite similar. Caffeine amounts in most coffees that are brewed. The study from a cluster that showed caffeine is variable by quite a bit. Even when they tried to standardize it from the same Starbucks the same type of coffee just gotten on different days. So it appears again this is based off of some testing they did which is unpublished yet. Via coffee is much more stable with Caffeine, as we know, the caffeine can change heart rate can change heart rate variability. I just studied looking at the effects of this on energy drinks using Monster Energy Drink. In this case, they also did use a decaf coffee too. What they found was acute HRV does increase after via coffee consumption. So we higher heart rate variability as a higher parasympathetic tone. In this case, heart rate was not significantly different. Now this may be related to the dose used, and maybe that they were habituated coffee drinkers. Not really sure, to be honest yet. But that was kind of not the

response, I would have guessed. But the confusing part about coffee too, is that you're gonna have a lot of neuronal associations with coffee. Some people drink coffee, is it more relaxing type thing, my guess is you're gonna see more parasympathetic response there versus someone who uses it to get, you know, jacked up before going to the gym, you're gonna see different associations there, they did a longer time course on this one. So timing, probably not a significant factor. But that can definitely be a different factor. And it also depends on the dose of caffeine. At some point, if you get up to a very high dose of caffeine, that's probably going to be your overriding effect. And at lower doses, especially in habitual coffee drinkers,



1:11:43

maybe



Dr. Mike T Nelson 1:11:45

not quite so much. And one of the last talks was really interesting. collagen peptides improve measures of physical function and the pain in middle age active adults. This was Rola kads, offski, I hope I pronounced your name correctly, they looked at collagen peptides, this was a company called a solid gel. And it was at six people, double blinded, randomized groups. And it was a very small dose that they used, I believe it was around 10 grams, which was split, I think, into two five gram doses. And they did show difference upon pain and other markers. I was kind of surprised by that. She was very nice, I got to talk to her for quite a while afterwards. And they're in the process now of looking at a lot of the different potential biomarkers going on, you know, maybe it's kind of triggering some other cellular events or growth factors. Because the dosing is quite small. This was in addition to their normal diet, it was a split dose was not necessarily timed before exercise at all. So really fascinating stuff. I think we'll find more and more emerging data on collagen related to soft tissue and even potentially pain. So I look forward to what they find. She said they do have a ton of data that they're in the process now of going through. But it was a pretty big study a pretty, pretty robust response. Again, she said, I think it took her almost two and a half, three years just to get some of the data collected. So it's easy when I get to sit at these conferences and ask researchers all sorts of crazy questions that the amount of time and data collection and everything that goes into, you know, something that gets, you know, whittled down to presented in like 20 or 30 minutes. It's pretty crazy. So big thanks to all the researchers for all the work that they did, coming to the event, presenting it. There was lots of other really great talks, too, wasn't necessarily trying to skip over all of them. But just due to the interest of time, I thought this would be a good rundown. Another quick shout out to is Dr. Chad kirksey did a great talk on plant based proteins. plant based proteins are kind of all the rage right now. Most of the data

would say that if you get a high enough dose with the correct amount of amino acids, you're probably still gonna see a good robust response from that. If you start getting into smaller doses, yeah, you know, your whey protein and some of your animal proteins are still going to be better. So this is something that if I work with someone who is more on the plant, protein side or even vegan, my first question is are you able to use a pro protein supplement at a higher dose. So one of my favorites is just a rice protein at around at least 40 gram dose. There's some interesting data showing that that is acutely comparable to whey protein. And there's a couple longer term studies on that. But I think we'll see more kind of intelligently formulated plant proteins, you can do some very interesting mixing of different types of proteins to complement each other, too. So that was good. I always had some great hallway, chats with people about this research, the poster sessions were really good, some very interesting data there. One of them was on, I think it was potentially the use of sarms. At a high dose. They did show some effects, but they also saw some side effects with that, which is interesting. And yeah, so if you can attend the meeting next year, and that's something you're into, I would highly recommend it. So hopefully, you've enjoyed this brief rundown of the International Society of sports nutrition meeting. If you enjoyed it, leave some comments below which ever you're on podcasts, iTunes, whatever. And yeah, give us a rating. Whatever you think is appropriate is all good, because that helps us all get more guests on the show, and helps get actual scientific information based on data into the hands of more people. So thank you so much. Really appreciate it. If you enjoyed this, definitely check out the flex diet certification. I've got technical sections in there are a breakdown interventions from protein, carbohydrates, fasting, micro nutrition, sleep, and much more. And then I've also got interviews with people in the research and the practical field also. We've got everything from Dr. Dan party, to Dr. Eric Helms, Dr. Stu Phillips, Dr. Jose Antonio himself, and many more. So go to flex diet.com flxdt.com. Get on the waitlist for the next time that it opens. I will also put you on the daily newsletter list. Thank you so much, greatly appreciate it. Talk to you all next week.