[00:00:00] Welcome back to the Flex A Diet podcast. I'm your host, Dr. Mike T. Nelson. On this podcast, we talk about all things to increase performance, add muscle, improve body composition, and do all of it without destroying your health in the process. Today, we're talking about the potential differences between women versus men.

[00:00:24] Should they be doing something different for exercise or even getting into a little bit of nutrition? And our guest today is Dr. Katie Hirsch. She is an assistant professor at the University of South Carolina. She's done a lot of great work in many different areas. She did a postdoc looking at protein synthesis and different responses there.

[00:00:47] And it's just a really great wealth of knowledge. She's primarily looking at differences between females versus males. in response to all the different aspects of exercise physiology. So this is great because I got to ask her all the questions that I've been getting a lot lately about, are there any differences between how women should exercise versus men?

[00:01:12] And the nice part about this is we were able to get into some of the details about what does the research actually say, Versus what do we actually do in practice? Cause actually most of my one on one clients, like 70 percent are actually women, which I know it's weird, even though I write to dude, bros in their thirties or forties to early fifties.

[00:01:34] So I have a fair amount of experience training women and it's interesting to compare what we know in the research, what we're looking at, and then also what are some different trends. More on the anecdotal side too. So, you'll really enjoy this episode. And then at the end I asked her for the Flux 4 question.

[00:01:57] What are the top four things that women should do related to exercise? So if you want that, if you're on the newsletter already, you will automatically get it as being part of the Insider Newsletter. If you are not, you can still get onto it. Go to MikeTNelson. com forward slash flex four. That's F L E X the number four.

[00:02:18] com.

[00:02:23] So if you want to get that on the newsletter, you can just go to MikeTNelson. com forward slash flex four F L E X the number four. And you will be able to get this one from Dr. Katie Hirsch and. All of the past ones

delivered directly to your inbox. Now that does also put you on to the Daily Insider newsletter also.

[00:02:50] If you're looking for some ketones that you do not have to be in a ketogenic diet, check out my friends over at Tekton for a very tasty ketone drink. These are ketones in the form of a ketone ester. Those two main forms of ketones for supplements. are a ketone ester and a ketone salt. The downside with the ketone salts is you can't really get your blood levels of ketones too high because the salts tend to make your gut very upset.

[00:03:22] With the ketone esters, however, you can. The downside is most of them taste horrible. This one actually tastes pretty darn good. And like I said, you do not have to do a ketogenic diet to get high blood levels of ketones, which is nice because you can still take carbohydrates in. For example, I had to do a training session the other day that was really short.

[00:03:46] I only had 20 minutes and I hadn't had anything to eat for probably four hours due to my schedule getting crazy. So I had a can of Tekton instead and actually worked quite well. So I really like that, especially if you're feeling just a little bit off, a little bit tired. I had a lift later in the day, so I didn't want any more caffeine at that point.

[00:04:08] So that's one of my favorite things to use them for. So check them out below. You can get a code to save some money. Full disclosure, I am a scientific advisor there and an ambassador for them. So enjoy this episode here with Dr. Katie Hirsch.

[00:04:25]

[00:04:26] **Dr Mike T Nelson:** Welcome back to the podcast. How are you doing today?

[00:04:29] **Dr Katie Hirsch:** I'm great. How about yourself?

[00:04:31] **Dr Mike T Nelson:** Yes, very nice. Good to see you again. We saw you briefly at ISSN and DC. Dr. David Church said, Oh, you have to have her on the podcast.

[00:04:41] I was like, Oh, that's a great idea. I had that on my list for a while. And I was like, Yes, this will be super fun.

[00:04:48] **Dr Katie Hirsch:** Yeah, well, happy to be here in chat. Always a good time.

[00:04:51] **Dr Mike T Nelson:** Yes. And the main topic today is the difference between male and female physiology. And I. To me, it's a fascinating area because the studies I did, we allowed both males and females.

[00:05:05] But even when I was doing my main studies for my PhD, at that time, my advisor said in a meeting, don't study females. They're a pain in the ass. Just use males. And I was like, okay, that seems weird. But on a pragmatic standpoint of Oh my God, I just want to finish my PhD and get the hell out of here.

[00:05:26] I get it. But on the other side, it's okay, well, then what the hell's going on? Are they really that different? Is there differences we should know about? And as a trainer and coach, I keep thinking, am I missing the boat on certain things for females that are different than males that I should be doing different?

[00:05:42] So we thought we'd have you on here and discuss some of the differences.

[00:05:46] **Dr Katie Hirsch:** Yeah, well, I love that story a little bit. I feel like I got told similar things by people. Oh, and it's

[00:05:53] **Dr Mike T Nelson:** not an uncommon story if you go back ten years. I could list a dozen people who heard the same thing. Yeah, you don't even

[00:05:59] **Dr Katie Hirsch:** have

[00:06:00] **Dr Mike T Nelson:** to

[00:06:00] go back

[00:06:01] **Dr Katie Hirsch:** that far, yeah.

[00:06:01] Yeah I think that's a, I mean there's reasons that get said, but now that's maybe exclusively what I study I'll fight back on almost all of those, so.

[00:06:12] **Dr Mike T Nelson:** Yeah, totally.

[00:06:13] **Dr Katie Hirsch:** But yeah, let's get into it.

[00:06:15] **Dr Mike T Nelson:** What are you at a high level? So one of the arguments of that, there isn't that much difference is if we take muscle out of a male, we take muscle out of a female and we put them in a dish and we electrically stimulate and we do all these things, there isn't really that much of a difference.

[00:06:33] So I think for. An interesting way to frame the discussion is if we look at a small all the way up to a large level of them, being a human organism can you walk us through a little bit on the small scale? Are there really differences that we're finding or not? And then at what level do we start to see differences that become significant?

[00:06:58] **Dr Katie Hirsch:** Yeah, that's a good question. I think that's something I like to work through that progression with my students and other people I talked to as well as I think with all this interest and how do we maximize female physiology? How do we best train females or nutrition wise? There's the recognition that males and females are different.

[00:07:22] But that kind of leads to the thought that. It's maybe something entirely different which isn't necessarily true. We're not talking about an entirely new way of doing metabolism. Like glycolysis still works like glycolysis, right? So we're not studying an entirely new system. It's more nuances of those systems and maybe ways that males and females just.

[00:07:50] the levels or the percentages and how that plays out. And so then really it's just talking about how are we optimizing to maximize those systems? Like I just in class today was talking about, like as an athlete, you're trying to maximize maybe certain metabolic systems to match your sport and your performance.

[00:08:12] And so I see it the same way with this as it's knowing that. There's some level of difference that it's really just how do we maximize that and play into that. And I think that's where we're at with women is how much of a difference and how much can we still play into that and try to help maximize that machinery and those percentages to really push them all the way.

[00:08:35] So, yeah, from a just like 101 type of a standpoint, like everything's generally the same. And I think a lot of the principles are still pretty much. similar. We're not going to suddenly say carbohydrates aren't the core for nutrition. So that's still really important. I think where we start to see some

deviances again, is like in that maybe percentage of, Carbohydrate and fat use at different intensities.

[00:09:07] And so especially it may be lower to moderate type of intensities. We do see females having a slightly higher percentage of reliance on fats for a fuel source. But as we get into max, like everybody should be. Relying on carbohydrate. That's our fast energy source. So, the conversation then as maybe, how do I play into some of those Fat and carb metabolism a little bit more.

[00:09:34] I think a big part is in females, we see much higher sensitivity to levels of nutrition and fueling. And especially when we're in an extreme calorie or carbohydrate deficit, that seems to, female bodies really respond and push back on that. And I take it clear back to a survival reproduction perspective, that makes sense.

[00:10:01] The female body's designed to produce another human and now we've got to keep two humans alive and survive. And so our bodies are really good at that. In today's world, we don't get put in that situation a lot where we're just trying to survive. But I think that's a lot of, The female body is just a lot more sensitive, so we start to have a lot more conversations of the importance, especially for women, for fueling being well fueled, going into exercise, not doing a lot of fasted exercise so that's where a lot of my work has really focused or in those aspects, and there's more beyond that, but that's where I tend to sit.

[00:10:41] **Dr Mike T Nelson:** Yeah, super cool. One of the things that even in exercise was one on one I was told is that women are just much better at using fat as a fuel. And that was just a blanket statement. It was never really backed up. I don't know why that message has always bugged me because I think it's just like all things it's too simplistic and it just throws out all context.

[00:11:03] And it's like some of the studies you were saying, there's some early studies showing that at the same percentage of max that females tend as a whole, do tend to use fat a little bit better as a fuel source. And I think you would probably agree with that.

[00:11:19] And

[00:11:19] **Dr Mike T Nelson:** the second part of that question then is, how much of that do you think is training related when it comes down to the individual that say, sitting across from me at a table I'm doing a consult with?

[00:11:31] Because we all know that. Yeah. When you look at studies, there are means, but then when you're working with an individual, it's an N of one. Do you have any idea of how much variance there is within those studies? Again, not to say that idea is not necessarily true. I just think it's more nuanced than what it appears to be at face value.

[00:11:53] **Dr Katie Hirsch:** Yeah, I think a couple of things play into that value all the way. I think that would be, yeah, the aggregate average. We tend to see women have a little bit higher percent contribution fat, especially in those lower states. If we look at an RER of a male to a female the females tends to be a little bit lower.

[00:12:13] The idea is that's being driven by estrogen, promoting a little bit more of that lipolysis, fat release all of that. But There are heavy influences, as on fuel use, as far as what's your diet,

[00:12:26] if

[00:12:27] **Dr Katie Hirsch:** you're someone that's consuming a really high percent carbohydrate diet, we're going to see that's going to push it up.

[00:12:34] Cause that's what you're feeding your body. And that's, and it has an abundance of that. And our bodies like carbohydrates. So it's gonna use that fuel if you're giving it to it. I think, and then definitely. Training status is going to play into that as well. So if I'm training my body to be more efficient and have that larger aerobic capacity, maybe that's helping a little bit more than if I'm really focusing on some of that high intensity all the time.

[00:13:04] So I think all of those pieces play into it. And it does get a lot more contextual. And I think that's where people who are working with top level athletes. It's that conversation of what do we really need to do to help you maximize that and what's going to help with performance versus for the average person we're talking more about just are our systems functioning on a healthy level?

[00:13:30] Maybe bigger conversations are you seeing that metabolic flexibility to switch from fats more at rest to carbs in those higher situations? If that disappears, that's probably not a great sign. And are we, yeah, using the right substrate in the right situation? So extremely contextual. And of course most things get then just that interwall when menus.

[00:13:55] More fat. Well, how much? What's the percent? Yeah, those are all considerations.

[00:14:01] **Dr Mike T Nelson:** Yeah, because where I've seen that statement go awry is that, oh, look at this study. Women are better at using fat. Therefore, this athlete doing, soccer or training at a higher intensity level they don't need that many carbohydrates.

[00:14:17] And I'm like, well, hold on. What are you talking about? Like you took a statement that's true. It logically might make sense if you don't have a background in what's actually going on. And then I think about my experience with at least higher level female athletes. Most of the time I'm doing everything humanly possible to get them to eat more carbohydrates because they're chronically under eating, their micronutrition is horrible.

[00:14:41] Every

[00:14:42] **Dr Mike T Nelson:** time they do, shockingly, they usually get leaner, their performance goes up, like everything improves. So I think sometimes there's a disconnect between what the research says, that doesn't mean the research is invalid, but the translation to a certain population, it gets all like a bad game of telephone.

[00:15:02] **Dr Katie Hirsch:** Yeah, right. It's this thing of, yeah, same thing. Like we started with even of just, it gets taken to an extreme, instead of realizing like it's relatively different, not extremely, it's not a whole new thing. So we're just talking about small adjustments. Yeah. A thousand percent and the carb thing.

[00:15:22] Yeah. Every person I know that works with female athletes, it's just, I'm trying to get them to eat enough calories and enough carbs before we can even nuances within that. So for sure.

[00:15:35] **Dr Mike T Nelson:** Yeah. I remember I had a female client for a while and we went down to a retreat center with my buddy, Ben House ran for a while in Costa Rica.

[00:15:45] And so they provide all the food there and training. It was education. It was amazing. And my client was so funny. She comes to me on day six. She's Oh, like all this stuff you've been telling me, like, All these women here, they eat so much food and so much carbohydrates and they look great and they can train hard in the gym.

[00:16:07] Oh, so what you were telling me, is that actually true? But it's until she was in an environment where she saw that actually happening, there's this kind of part that's disconnected. That's Oh, I don't know. The media is telling me all this other stuff. And so it was interesting to have that experience of, Oh, okay, yeah this makes sense now.

[00:16:31] Yeah.

[00:16:32] **Dr Katie Hirsch:** And that's a very real scenario. I feel like women especially are bombarded with. this diet trend, that diet trend, and especially with the excitement around women's health, like grabbing onto all kinds of stuff and the influencers are throwing all kinds of stuff out there. And it does get really confusing of, well, what have the supplies to me and my scenario?

[00:16:57] And so it, yeah, it does get complicated. So I feel for them.

[00:17:02] **Dr Mike T Nelson:** Is you mentioned metabolic flexibility, which is obviously one of my favorite topics, but do you think there is any. If we look at the research, any difference in males versus females related to metabolic flexibility? And the second part of that question is, how, if there is, would you do anything different training and nutrition wise because of that?

[00:17:23] **Dr Katie Hirsch:** That's an interesting question. I guess the way I typically think of with metabolic flexibility is just trying to evaluate how efficiently and you can switch between those fats and carbs as we increase that intensity. And the way I studied it a lot going through grad school was we were using it more in like overweight, obese individuals to as an early marker of.

[00:17:52] So you're laying here at rest and your RER is Well, above 0. 85 and to that, you're using

[00:18:00] **Dr Mike T Nelson:** a ton of carbohydrates at higher

[00:18:02] **Dr Katie Hirsch:** percentage of carbohydrates but you're just laying here. And so then not seeing that change in that swap from the carbs to the fats. And we have talked about it in context of athletes as, at rest, they look okay, but as that intensity starts to ramp up, it quickly jumps up and they immediately jump up to her carbohydrate, which.

[00:18:23] Then you can start asking the nuanced question of should that be more gradual from a like, glycogen depletion type of a standpoint or do we want to see it swap that quick that early, or what's going on all the way, and so, from

a male female standpoint, like how that would play out and function differently, I'm not entirely sure how different That swap should look or that change or that difference should look but some interesting things we've used it for again, is that early sign of maybe some developing metabolic dysregulation in more of our healthy, overweight, obese individuals Abby Smith Ryan had a big kind of menopause cross section study and they did show that during her last year.

[00:19:06] Like a graded exercise type test that change and how they changed from the fat to the carb use with that increasing intensity started to really change during that perimenopause period, and they maybe showed a little less ability to switch or it wasn't mapping like we would maybe expect. And so, again, just another indication of, all right, is that a diet thing?

[00:19:32] Of course, that speculation was. It's that hormonal dysregulation that's starting to happen. But again, is that another early sign of metabolic dysregulations developing? How can we target that with the nutrition and exercise? So those are the contexts we've mostly used it in application, which I think is.

[00:19:53] Kind of a unique and gives just that additional level of insight beyond just what are you using in this exact moment, but how is it changing? And is it changing the way we expect?

[00:20:05] **Dr Mike T Nelson:** And so in that study, correct me if I'm wrong, if I remember that as they were getting closer to menopause, they were becoming less metabolically flexible.

[00:20:13] Is that correct?

[00:20:14] **Dr Katie Hirsch:** Yeah. Yeah.

[00:20:16] **Dr Mike T Nelson:** And how much of that do you think is hormonal related to maybe aging, detraining, other factors that we know for sure obviously are going to affect that.

[00:20:28] **Dr Katie Hirsch:** Sure. Sure. So that's a huge piece. And that's, I think the big debate, one of the big debates with the menopause transition is how much is just due to aging and how much is due to the hormone changes.

[00:20:40] And I really think they play on each other. I think aging is a piece. But when you throw on that hormonal dysregulation for any female that's experiencing that before, like we feel fluctuations just within our own cycles

and that's dependent on the female. But now suddenly you throw in this wrench of the fluctuations are getting bigger and more wild and more highs and lows and not as consistent.

[00:21:10] And that does generally create a more inflammatory and chaotic profile, like your body's not. following that rhythm anymore. And every time those hormones switch, now we're sticking it in a slightly different situation and it's adjusting. And so I think the two do play on each other. And as we're trying to tease out how much of an impact on the physiology, I think just even the level of symptomology that can come from that.

[00:21:40] Like suddenly, if I'm experiencing a whole lot of fatigue and brain fog throughout that, Now I'm just not as interested in exercising. It's hard to get myself motivated. And so now getting out and doing the exercise is drastically harder, let alone something higher intensity that might be helpful. So I think all these pieces play on each other and exacerbate.

[00:22:04] So I think it's really hard to tease them out individually. But I think it does all create an environment that does. Really drastically, and we've seen that in the research, increased disease risk. As they go through that and come out the other end and post menopause with a lot of that metabolic dysregulation.

[00:22:23] So I think it's coming both directions really creating that storm. So,

[00:22:31] **Dr Mike T Nelson:** yeah, I keep thinking of if there was a population you could look at that went through menopause, like earlier versus. People who went through later or some way you could disentangle the time factor, but still have the same hormones changing and that type of thing.

[00:22:48] But yeah.

[00:22:51] **Dr Katie Hirsch:** Right there with you. I think we've been trying to ask those questions and even this is just where study of women is really behind. And something I'm passionate about is like, how do we even study this correctly? Yeah, I was. with Abby starting to dive into this and really ripping apart like how would you watch someone go through that progression and really define it and there's just not even like super great ways To identify like where they're at in that whole progress

[00:23:24] **Dr Mike T Nelson:** even just defining what exactly is Menopause like everybody knows it happens.

[00:23:29] Everyone knows but it's like this gradual thing and there isn't at least correct me if i'm wrong Good markers to say. Oh these two or three markers. You're definitely in menopause here You're not it. It seems a little bit more shades of gray.

[00:23:42] **Dr Katie Hirsch:** Every menopause window is tricky because yeah, it's super variable Some women like It's a really short process.

[00:23:51] Some women, it's seven plus year process. And there's really that I've seen a great way to fully say what's this process going to look like for you? How much longer do you have? We've got pieces and that's what physicians are doing, but it still is, yeah, quite a bit of a guessing game. And Yeah, a tough time, which then, you know, just the piece of we now have so many women that are wanting to keep exercising and even competing at a pretty high level

[00:24:24] through all

[00:24:25] **Dr Katie Hirsch:** of that and beyond.

[00:24:27] And I think I attribute a lot of this pressure. I give those women a lot of credit because I think they've really spoken up and said I want to keep competing. Someone helped me through this. My body's responding differently than it has in the past. And so I think that's just another piece of the puzzle.

[00:24:44] That's helping push it along a little bit is yeah. How do we help those women keep competing like they did through that?

[00:24:52] **Dr Mike T Nelson:** Yeah. And the handful of those women I've worked with that are semi competitive, it just feels like the amount of variability that got thrown into their system is really high. Like the ability to find more stable periods, whether it's training, nutrition, sleep, recovery, whatever is just, in my experience as the coach is much more difficult and I find I'm changing stuff a lot more often than outside of that period.

[00:25:21] And again, I don't know if that's Hormonal driven, that's stress driven, that's just where they're at. I don't know the causation of it, but I do know that the pattern of just having this more variability seems to be there a lot. I don't know if you've seen anything like that.

[00:25:37] **Dr Katie Hirsch:** No, I'm not surprised at all.

[00:25:38] That seems on par. I think it gets really, I'll just describe it as chaotic a little bit.

[00:25:45] Yeah.

[00:25:47] **Dr Katie Hirsch:** It's not consistent anymore and even it gets hard to predict and so, you went from at least like a cycle is still variable, but you can predict to a degree. This is just, yeah totally something different and not consistent.

[00:26:03] And so, yeah anyone trying to do that on their own all the way, it does feel really chaotic and stressful. And a lot of adjustments have to be made until they get through that. And then you have the new. More steady state post menopause where you can, okay, now things are a little more balanced or just consistent and how do we now work with that new baseline, but that time period through there, yeah, gets pretty crazy.

[00:26:33] **Dr Mike T Nelson:** If this is more of a medical question, but I'm sure you get this all the time is if women are considering, hormone replacement therapy, what would be your advice to them? Like my general advice was. Obviously, find a good physician you want to work with is outside my scope of practice, of course.

[00:26:50] But if you look at some of the data, it looks if you're going to do it sooner than later if you're trying to mitigate some of the risk. And then, obviously find a physician you can work with that can titrate it, make sure you feel good and do testing, that type of thing.

[00:27:04] **Dr Katie Hirsch:** Yeah, I think that's generally a good recommendation.

[00:27:08] Yeah, I'm always going to defer to the physicians on that one. But like what I've learned in talking to women that are making those decisions, especially is a lot of it even just depends on the training of the physician right now.

[00:27:23] **Dr Mike T Nelson:** Oh, definitely.

[00:27:24] **Dr Katie Hirsch:** And the school of thought. So is it, do we focus more on the estrogen?

[00:27:28] Do we focus more on the progesterone? Do we focus on something entirely different? But I think especially if you're having pretty severe symptoms or That are disruptive enough. To all those other pieces of the puzzle, your sleep, your ability to focus. That's now like now causing additional dysregulation probably on top of whatever's already happening.

[00:27:53] I think, yeah, definitely worth a conversation to, hey, let's try to balance this process out for you a little bit and get you through it. Less in a dysregulated state. And then we can, but it's going to be a constant process and you're probably going to need a team of people which is a can of worms in and of itself, but to find the right people that will listen and get you the right help.

[00:28:18] But yeah, definitely going to take a team between, the hormones, the diet, the, all of it.

[00:28:25] **Dr Mike T Nelson:** And that's the really caveat I've given them is that even if you find a physician who's really good, who wants to work with you, who's very knowledgeable and trained in that area, rarely have I ever seen, it's a simple process of Oh, you just need estrogen.

[00:28:37] Here you go. Woo. Everything's great. Yeah. Your life is wonderful. Now we fixed all your stuff in two days. Like it just it's. In my experience with a handful of people it's never been that simple. Like even with the best intentions, even with the best education, it's a process of, okay, let's try this, let's see how you feel.

[00:28:53] Okay. That looks a little better. Let's try this. And that, like you said, it's a process. It's not just like turning on and off a light switch.

[00:29:01] **Dr Katie Hirsch:** Yeah, no. And it's going to be a process through that entire transition probably of, Constantly. Okay. You're feeling worse again. Let's try this adjustment and that's not helping.

[00:29:12] Let's try it. Just like you said, but yeah, it's going to be a process. No matter what

[00:29:19] **Dr Mike T Nelson:** related to fasting. If you go online, I've seen everything from, Oh my God, women. Oh, you should never fast, especially if you're, perimenopause or even younger to, Oh, if you're a woman, like fasting is the best thing you can do because of Blah, blah, blah.

[00:29:34] Like any thoughts on that? Cause I'm sure you get these questions way more than I do.

[00:29:38] **Dr Katie Hirsch:** Oh yeah. All the time. I joke all the time. I can't get through any talk. It doesn't matter the topic. Someone will ask me either about intermittent fasting or keto. It just, that was

[00:29:50] **Dr Mike T Nelson:** my next question. Yeah. You read my mind.

[00:29:54] **Dr Katie Hirsch:** Like it doesn't even have to be diet related and someone

[00:29:58] **Dr Mike T Nelson:** Should I keto?

[00:30:00] **Dr Katie Hirsch:** Yeah. So the fasting thing is fascinating. I just to get to the point for premenopausal women. I'm not a huge fan at this point in time. The reason I say that is because female bodies, especially premenopause are very sensitive to calorie intake, calorie balance.

[00:30:25] And from my experiences and a lot of the women I end up talking to, we're already struggling to get in enough calories and meet those needs. And so by adding on this layer of now extended fasting is that now just playing into that mechanism even more and triggering that even more and creating this long term low energy state over time.

[00:30:50] And so if you look at the data, even all of our studies for the most part on fasting, And its mechanisms are done in all men. There's very few, very

[00:31:01] **Dr Mike T Nelson:** little data

[00:31:02] **Dr Katie Hirsch:** include women in these studies. And so that's why just knowing based off of the women that I've worked with and seen, and what I know about female metabolism in that sense, I'm not a huge fan, there's always someone that it's probably going to work great for.

[00:31:21] So there's always that caveat, but I do think as. women get into that post menopause period. So after they've already gone through perimenopause and those hormones are generally lower and now stabilized and we don't get those fluctuations. I do think I've seen anecdotally a handful of women that can work really well for them.

[00:31:45] I think once that estrogen goes down some of that fasting, the body's a little bit less stressed Reactive to maybe the calorie intake. I don't know all the way, but from observation, it is seems less of an issue post menopause than maybe pre menopause. And so future study to do by myself or somebody else.

[00:32:07] But That's generally where I just stand with the fasting in general. But I think we need a lot more for women specifically in that realm.

[00:32:17] **Dr Mike T Nelson:** Yeah. And that kind of matches what I've seen. So 70 percent of my clients I train are women. Do I have a fair amount of them do fasting? I actually do,

[00:32:25] but I

[00:32:26] **Dr Mike T Nelson:** would say the caveat is Across the board.

[00:32:30] Would I recommend it more to women? No. And probably for the reasons you mentioned, because if I'm looking at HRV, I'm looking at stress markers.

[00:32:38] Yeah.

[00:32:39] **Dr Mike T Nelson:** Odds are women just appear to be way more stressed than guys. Like just if I make a blanket statement across the board, which I've never been able to.

[00:32:48] completely disentangle because fasting is a stressor like do I really want to throw another stressor on top of someone who's All their system is telling me they're already very stressed. They tend to undereat micronutrition may not be the best they have more responsibilities the answer is probably not.

[00:33:06] But if I go back and look at the literature, like you said I can't show any data that says, Oh, look, here's women. Here's men. They did a period of fasting. It's most of the studies are almost all men. So you can't, there's not a whole lot to fall back on, unfortunately either.

[00:33:21] **Dr Katie Hirsch:** Yeah. Yeah. Really hard right now to disentangle that at all.

[00:33:25] So all speculation and yeah, until we see a little more, I think it's a case by case. type of a basis. I think the things you were mentioning, I would totally agree with that. Yeah, evaluating all that stress seems like a good idea.

[00:33:39] **Dr Mike T Nelson:** And then the keto question then should women keto then?

[00:33:42] Because I, again, going back to, oh, but women are better at using fat, so therefore they should be doing a ketogenic diet. And I don't know what you've seen, but what I've seen is Unless it's a medical thing, right? So there is some, medical cases for that, which is outside this scope of conversation.

[00:33:59] Most people I've seen do a hardcore keto diet end up drastically under eating for probably where they should be. And their performance, especially on high intensity stuff, just like drops.

[00:34:13] **Dr Katie Hirsch:** Yeah, I just as a blanket statement again, I don't usually recommend keto to anybody just because it's so extreme and I think

[00:34:21] **Dr Mike T Nelson:** compliance is another issue.

[00:34:23] **Dr Katie Hirsch:** Yeah, huge compliance issue. And just living your life is like impossible with that. And I tend to see like most people that say their keto, I feel like it's probably just a low carb diet. And maybe not a truly defined keto diet. So I was just saying, how about we just maybe instead focus on a high protein, low carb, that's probably more sustainable and doable.

[00:34:47] Back to the keto question though it is funny, I, yeah, the well, women are better at using fats, and so I, at one point, was like, asking that question of well, if you're gonna put a female on a keto diet would they handle it better to a extent than a male and I remember it was at that time Louise Burke was doing a lot of her initial Keto type studies with the race walkers, all in men and it was driving.

[00:35:17] And I was like, but if someone's probably going to handle it, well, if we're gonna hypothesize that, like, why aren't we throwing women in there? They probably would do a little better. I'm not saying they do great, but and I, stopped following that train of research quite as closely, but I think she did at some point finally throw Do a cohort of women or thought about

[00:35:40] **Dr Mike T Nelson:** study.

[00:35:41] I'm mixed if I remember right I could be wrong on that. Don't quote me on that. It was

[00:35:45] **Dr Katie Hirsch:** a whole female study. Yeah, don't quote us on either.

[00:35:49] **Dr Mike T Nelson:** Yeah

[00:35:50] **Dr Katie Hirsch:** I know at some point she mentioned it, and I think she did a mixed at some point. I think you're right. But either way I think the conclusion was, like, it's still not great for performance regardless, which makes sense physiologically.

[00:36:03] So I can't remember if the women did, in theory, handle it better or not, but Yeah, I've thought, entertained those questions a little bit. For anything too extreme though, I think yeah, it's just a more extreme option.

[00:36:17] **Dr Mike T Nelson:** Yeah it seems like unfortunately in fitness and nutrition, the more extreme is the thing that people sell, right?

[00:36:24] So if you want to write a popular diet book, just say never eat gluten or, low carb for life or whatever. Like you have to demonize one whole food group. And unfortunately it appears like women get. More targeted with these things stating, well, you have, hormonal changes and things like that.

[00:36:42] So you need to do this type of diet and it's never Hey, how about you have enough carbohydrates to feel your performance, have higher protein and eat some fat. It's, Oh, don't eat any carbs. Make sure you only do keto or never fast or only do fasting. And unfortunately, it seems like it gets much more targeted at women than it does males.

[00:37:01] Unfortunately.

[00:37:02] **Dr Katie Hirsch:** Yeah, I would agree with that. I think it's easy to play on like fears and body image and I know that goes both way, male and female, but I think females especially, it's just the constant pressure of looks and our bodies. And so, we get that thrown at us quite a bit for sure.

[00:37:23] **Dr Mike T Nelson:** Related to training and you're, there's lots of things now that says females should train for their specific phases of their cycle. What are your thoughts on that? The data I've seen, I know blanket on her name from Stu Phillips lab did one study on this and there's been one or two other pieces where.

[00:37:41] I don't know. I'm not saying there's no, obviously there's real physiologically changes that are going on. I tried doing it with some female clients probably three or four years ago.

[00:37:50] Yeah. I

[00:37:50] **Dr Mike T Nelson:** can't say anecdotally. I got any better results, but I can say in all those cases, that's all we ever talked about then, and I felt like it might be a player, but it's your calories are still low. You're sleeping five hours a night. Like I know these things are going to help you, but. It was like they became very, focused on that thing of trying to determine what phase they're in and do they really need to change their training or not?

[00:38:15] And

[00:38:16] yeah, so

[00:38:16] **Dr Mike T Nelson:** I ended up dropping it just more from a pragmatic standpoint because I felt like I as a coach was doing them a disservice by Having them focus on something that was more minor when they had other things that were probably a little bit bigger things that needed to take care of.

[00:38:31] **Dr Katie Hirsch:** Yeah, that's interesting. Because yeah, really, all we have to go on right now are these Case by cases and people that have tried to implement it and really track stuff closely and right. The data right now doesn't support having to train that way. So there's nothing that says women should train that way.

[00:38:53] Vice versa. We don't have data that says we shouldn't either. I think the largest limitation is Just how do you even practically do that, knowing that every female cycle looks very different and ovulation happens at different times. So it's not something just as simple as here's when my period was and so now days 1 to 5 I do this, days 6 to 14 I do this.

[00:39:22] And I think that's what Lauren out of Stu's lab was saying. That's what her paper, I think, was really arguing is practically how do you even all the way implement that to be maybe the level of effective that we need. I think to some of your other points, like the level that's going let's say it does for sure help a lot hypothetically.

[00:39:48] For who that's probably going to help the most is like our elite athletes, because knowing for the average individual, our biggest factor is just

consistent exercise and good diet. And so, but where I do think things need to come into consideration is. If that's what someone's worried about or interested in or feels like they would like to consider, I think a good baseline is, okay, let's just start tracking your cycle and how consistent is it?

[00:40:22] What is a consistent ish length for you? And for me, even bigger is just let's track your symptomology. And if we're seeing consistently around this time in your normal cycle that you always feel tired, or you always have bloating, or you're always cramping if that's showing up pretty consistently, that's might be hormone related.

[00:40:51] And then now we can maybe be really strategic with. some nutrition to help manage that. Or like maybe we just, we know that's coming. And so we're not going to plan our hardest workout that day, but that's coaching, right? That's how that goes anyway. But I think it just then allows you to put it on your radar.

[00:41:14] If that's something coming up. So I think too, there's levels to that. Like this is another one that just gets blanket statement. tossed out there all the time. And so, no, there's nothing that says you have to train that way. There's also nothing that says it's better or worse than what is already being done.

[00:41:34] We need a lot more research on how much this does change. I think our methods aren't even quite there yet to tease that out. But I think some high level things is just, okay, can you at least just start tracking for you? And if you feel fine through the whole thing, maybe it Don't stress yourself out about it.

[00:41:53] So those are just some thoughts.

[00:41:56] **Dr Mike T Nelson:** Yeah. And it, it seems like some women are more sensitive to it than other women. Like I've had some where it didn't make any difference. Like what part of their cycle they were in, like their training was super consistent, everything. Like they had very few symptoms, like even body weight didn't change that much, not a lot of fluid gain where other women would be very sensitive to it.

[00:42:17] But the. The ones that were a little bit higher level knew that it was coming. And so they would make a note of the training journal okay, it's, the blah, blah, blah, this part of my cycle, my body weight was up, two pounds today. So I didn't feel as good. But I know this is normal for my system, so I didn't really push it today.

[00:42:35] We look at their HRV scores. They're down a little bit of what they normally are. So yeah, that makes sense. Okay. Let's back off your training a little bit, but I feel like a lot of those until we have better data, which we don't have very good data at all right now,

[00:42:48] I just

[00:42:48] **Dr Mike T Nelson:** feel like a lot of it now just comes, Back down to decent coaching.

[00:42:52] It's if you were not feeling very good, like your performance isn't there, then yeah, let's find something else to do. That's going to work a little bit better. Later. We can maybe try to have research and try to figure out, okay, why did that happen? What's actually going on? But I think my mistake when I implemented as I was trying to be.

[00:43:09] Predictive and not reactive. And that was my mistake because it was just, it was a disaster.

[00:43:16] **Dr Katie Hirsch:** Well, yeah, generally have right now. It's hard to be predictive. So that's like something my group's trying to work on is there's got to be better ways to even track and know your cycle, because actually the number of women with a stereotypical cycle and hormone fluctuation is not even the majority,

[00:43:38] And that changes a lot depending on your energy level and what type of contraception you're on, and there's That's it.

[00:43:46] almost more non normal scenarios. Normal scenario. And then just, yeah, just to go back to the like menopause women, you start, you get into that territory and now nothing's stereotypically normal. And so how would you ever know? And then I think about Pregnancy, like during leading up to it, the time after that's a whole nother category and profile.

[00:44:14] So yeah, that's all just to reiterate that the one normal profile we're trying to build off of is actually not the most stereotypical and so until we have ways to individualize that a little bit more, it's going to be hard to be predictive all the way.

[00:44:34] **Dr Mike T Nelson:** I don't want to make the argument that training itself, We just can't really be that predictive as much as we would like to say that.

[00:44:41] Like I can get pretty close to clients that I've worked with for A year or two, but that's just experience, that's just like putting them in a black box. And I know when I put this in, this comes out, I can't tell you why or what's really going on in the black box.

[00:44:55] It's just, you do it enough times. You can recognize what patterns there are, but that's not because of I'd say some magical knowledge per se.

[00:45:05] **Dr Katie Hirsch:** Yeah. Yeah. Well, and that's, yeah. You get to see a lot more of that, like actually training and working one, one on one with people a longer term. Then I see, they just come into my studies and then are out again.

[00:45:17] So I've got myself to test on, but beyond that, so that's good insights.

[00:45:24] **Dr Mike T Nelson:** Yeah. And related to the things that you do different personally now than when you, let's say before you started your PhD to where you're at now so obviously you've been studying this stuff for a long time. You have experience with running the studies, you're obviously doing exercise and stuff yourself.

[00:45:40] Yeah. I'm

[00:45:41] **Dr Mike T Nelson:** curious on a personal level, are there things that you changed your mind and changed your own practice with?

[00:45:49] **Dr Katie Hirsch:** Yeah. Yeah. My like journey with nutrition has. It's been all over the place. I think as most people who get interested in nutrition, you're always a little bit curious and let's try this or try that and you try things with the knowledge you have at the time and then you look back and you're like, man, I don't know what I did now.

[00:46:09] So, yeah, a lot of, My training through the years, has really focused on protein. So I think my views on the importance of protein, especially for women, the importance of maybe timing of nutrition for women specifically I think there's a lot of still potential there. That could be really advantageous, still a lot of nutrient timing studies done like almost all in men.

[00:46:38] So,

[00:46:39] I think even that data

[00:46:40] **Dr Mike T Nelson:** is split. Yeah, you have like data from earlier from Paul crib that shows amazing another follow up data. It's

[00:46:46] **Dr Katie Hirsch:** Well, and again, yeah, I think a lot of it's like what outcome and yes Population are big pieces of it.

[00:46:53] Yep.

[00:46:53] **Dr Katie Hirsch:** So yeah, like for myself a lot more of trying to Are we getting that good, really prioritizing that protein intake trying to fuel better right around my workouts.

[00:47:05] So I can get the most out of those. Our Senate, I try to keep it pretty simple. Try to be a lot more efficient with my workouts. And just get the most bang for my buck most of the time, just from a time demand type of a situation. So, yeah, those are some of the bigger ones. I think I've shifted a lot over time.

[00:47:25] **Dr Mike T Nelson:** Related to nutrient timing, what are your kind of current recommendations for that on the more, I don't want to say research side, but the more practical side, because that's a question that comes up a lot.

[00:47:36] **Dr Katie Hirsch:** Yeah, I think especially focusing on women, a lot of women think fasted exercise, especially if we're trying to promote weight loss, fat loss.

[00:47:46] And a lot of like the research we were doing while I was in Abby's lab through grad school would suggest otherwise for women, especially, so. Especially for performance

[00:47:56] **Dr Mike T Nelson:** too.

[00:47:56] **Dr Katie Hirsch:** For performance. Oh, 100%. Yeah. Yeah. And so, yeah, getting in, trying to talk women through that of, okay, let's at least get something, like something's better than nothing we've shown, and then if you can definitely get some protein in before that seems to play really well with some of the metabolic outcomes after and at least just ultimately, if anything, helps you feel better, and you know this and have seen this all the time, but at least you feel better working out.

[00:48:26] Get a little bit more out of it. Be more consistent. Hopefully with that. So yeah, we can encourage everyone like try to get something in before you eat what that is. A lot of it's going to depend on what your stomach can

handle. But that's where supplements are really helpful. You're like Gatorade type things to get some of the carbs, if that's easier for you to get down.

[00:48:49] Amino acid supplements are really helpful for that. If whey still sits a little bit too heavy to mix with stuff. And then after like really prioritizing some of that protein intake as soon as you can, which most people are more familiar with. From the recovery standpoint, but like those are also key opportunities to just when we're having trouble getting enough carbs and energy to, okay, let's sneak some in there and then go home and eat your dinner.

[00:49:18] I think something a lot of women to Maybe don't prioritize things like breakfast quite as much because it's get up, drink my coffee. I'm trying to get out the door and maybe I brought it with me, but then work demands hit or had to get the kids to daycare and it's easy to unintentionally fall into that intermittent fasting pattern even though you weren't really trying to do that, but it just life puts you in that scenario.

[00:49:44] But I think some things like I've talked through with people before is, well, if you can eat a little bit sooner, does that then help curb like more of the extreme cravings later in the afternoon, or does that help balance out fatigue that hits later in the day just to try to help you be more balanced and consistent.

[00:50:03] So we don't have such yo yoing energy levels, yo yoing craving type things all the above. So, that's where I think some of those combos can be helpful.

[00:50:15] **Dr Mike T Nelson:** Oh, that's great. Do you feel like protein is becoming more, a better word, accepted with women now? I feel like they used to be afraid of it, and now I feel like the tide's kind of turning and it's being more accepted.

[00:50:29] But I still feel like they're afraid of carbohydrates. That's

[00:50:33] **Dr Katie Hirsch:** still, yes, I think protein's more, getting more accepted. I think now I tend to have more combos. It's not. So much about like how much protein that's still a combo, but now it's protein quality. I think a lot of women can still grab gravitate to more plant based proteins, which is completely fine.

[00:50:56] And there is probably some gut and GI connections there on how hormones are impacting GI symptomology and energy levels can impact that symptomology. And that's, we just know GI symptoms are usually higher in a

lot of women, but it's that conversation of. Okay, if we're gonna do plant based, we're gonna have to start doubling our dose of a lot of things.

[00:51:22] Is that okay from a calorie perspective? Can you even consume that much? Depending on what source you're coming from. And so that's Especially while I was in Arkansas working with Arnie and David was a lot of these like perimenopausal and postmenopausal women really want to gravitate that direction a lot of times due to even perceptions of that's better for my cholesterol and other health aspects and, Sure.

[00:51:52] I get that, but when you're already slipping into anabolic resistance and now we're taking in lower quality protein what are we now missing out on from that benefit of stimulating muscle appropriately? And that stimulating that whole body protein turnover. So, that tends to be a lot of my combos now is okay.

[00:52:14] You're okay with the protein, but how do we make sure it's good quality? And you're like really getting out of it. What you think you are.

[00:52:22] **Dr Mike T Nelson:** Yeah, no, that's great. And a couple more questions as we wrap up any difference in the use of creatine between males versus females, and I just got a bunch of crazy questions about.

[00:52:38] We'll say creatine claims in women that I could not find any data to base it on, but I also could not find a huge amount of data that's looked at males versus females either. So

[00:52:49] **Dr Katie Hirsch:** Yeah, no. And that's. Totally fair. I'll shout out to Abby's group again for, she's done a lot of stuff recently with creatine for women in particular.

[00:52:59] From right now, there's not really a difference in the recommendation. And if anything, there's some unique benefits to taking creatine for women. So there's some really, Interesting benefits. The new thing right now is brain benefits of creating that seems to be Like a little bit of a hotter topic and there's some data to suggest like those benefits especially appear in women and especially for helping to maybe offset some symptoms of depression and things like that.

[00:53:31] Now, I don't know the level of is that due to. varying levels of just creatine intake in the diet all the way. I do, the study I'm thinking of, I forget who the author was, but I do think it was just looking at dietary intake. And they

were saying a higher creatine from the diet really helping in women in particular with depression symptoms.

[00:53:57] But so from that standpoint, there are like some reproductive benefits. I know Darren Kandow has been doing some really good long term work on Bone density. Super cool

[00:54:11] **Dr Mike T Nelson:** study on that. Yeah.

[00:54:13] **Dr Katie Hirsch:** He's that's better

[00:54:14] **Dr Mike T Nelson:** geometry, but not bone mineral density. Yep.

[00:54:18] **Dr Katie Hirsch:** That was like a

[00:54:18] **Dr Mike T Nelson:** 1. 4 million multi year study.

[00:54:23] It's crazy.

[00:54:25] **Dr Katie Hirsch:** Huge. So I think if anything, we're seeing like, yes, men and women get the same benefits in general, and then just, there's some unique female pieces. That can just add to it. So that one, I think sometimes there's a little bit of resistance with that, just out of not knowing about creatine. But I think with having that combo definitely a good thing.

[00:54:52] So there's nothing to say no. So,

[00:54:56] **Dr Mike T Nelson:** yeah. And you would think creatine monohydrate, five grams, unless you're like some of the neuro studies, I think like Eric Ralston has talked about. You might need to go 10 to 20 grams in humans, but you have such little data on that because you have to do MRS and some other way of assessing that.

[00:55:13] And the creatine stores are not the same as they are in the muscle. And it gets really messy pretty fast.

[00:55:19] **Dr Katie Hirsch:** Yeah, exactly. So yeah, I think the recommendations, yeah, still that five grams a day. I'm with you. I've heard the for the brain, we probably need to go higher. So some people have even asked me like, well, should you adjust it to a relative dose?

[00:55:37] And I'm always like, well, you could for sure. I don't think there's any harm in that. I think since on average, women tend to be a little bit smaller than men. Five grams then relatively is still a little bit higher dose. So I'd rather err on the side of maybe a little bit more than not enough. So yeah, I think those recommendations still all work.

[00:56:02] There is a little bit of data that like trying to time it with menstrual cycle, maybe could help offset, if you're struggling during certain phases, like the high hormone luteal phase with. Like higher intensity output, but specifically loading a little bit then might help offset that deficit that's happening.

[00:56:23] But we need a lot more in those kinds of areas to show. Yeah. How could you maybe uniquely time it a little bit to help with some of that symptomology?

[00:56:32] **Dr Mike T Nelson:** Cool. Any supplements that you'd recommend or that should be considered more for women than men just in general?

[00:56:41] **Dr Katie Hirsch:** In general, I think they all just have their time in their place a little bit. There's very few that I think I blanket recommend. I think it's all pretty situational. I do think this is a freebie, but like a protein supplement can be really helpful.

[00:56:57] Sure.

[00:56:57] **Dr Katie Hirsch:** With getting it in taking it in the middle of the day, I think from a convenience and a lot of women like, are we getting enough?

[00:57:05] So that's really helpful. Creatine is obviously one of the few that I might blanket recommend a little bit. There's enough benefits across the board. So I think that one's a good call. You could get into some of the micronutrients that are just harder to get in. Through the diet, but some of those I think are conversational based and

[00:57:25] **Dr Mike T Nelson:** yeah, I don't even like iron.

[00:57:26] Obviously,

[00:57:27] **Dr Katie Hirsch:** well, yeah, get an iron test. Women tend to be lower. Yeah. Yeah. That's probably another one. Do you have some you tend to recommend more?

[00:57:36] **Dr Mike T Nelson:** Not really. The only big differences, like I would say is for women, like definitely get an iron panel because I've lost track of how many women have just been just.

[00:57:46] low or screwy stuff with ferritin compared to blood levels and that type of thing.

[00:57:51] A lot of

[00:57:51] **Dr Mike T Nelson:** times you can get a pretty good idea by just looking at their seven day, diet record.

[00:57:55] Creatine I do like just because of all the benefits, protein. Yeah. I don't have any that I would say are hyper specific to women, but I'm always curious.

[00:58:06] Cause again, the marketing is always, Oh, if you're a woman, you definitely need this or that. And I find most of them with the exception of iron and some other things like that tend to. Yeah, relatively similar.

[00:58:18] **Dr Katie Hirsch:** Yeah. Yeah. I think what, like when I have give some of those talks or have more of those specific conversations, it's more discussing situations maybe that are unique to women where we can take advantage of, yes, we need more data.

[00:58:34] But based off of what we know about these supplements that could be advantageous for certain situations. So that's just where. Yeah, if I know I'm struggling in certain hormone phases with Really reaching that like high power output and I just feel like I can't quite get over that threshold and give it my all.

[00:58:55] Okay, would timing creatine a little bit, doing a loading phase and really trying to get a little extra in or doing beta alanine for a little while, or think like with pain, we really have bad kind of strategies for that other than ibuprofen medicated. But are there some things I could do to help just lower some of that inflammation that's happening and maybe playing into that and that would lessen it.

[00:59:23] A lot of women struggle with brain fogs, fatigue. And so, While we're working on the lifestyle stuff, is there a time and a place for some of the nootropics to just help maybe take the edge off some of that So I think there's some unique opportunities like pre post pregnancy.

[00:59:41] I think there's a ton of opportunity to help women get through that a little bit more smoothly. So, I think it's just more talking through, okay, what are we dealing with in this scenario? And what do we know? What do we have in our toolbox to help you get through that?

[00:59:56] **Dr Mike T Nelson:** Yeah. On the cognitive side, are there any nootropics that you like?

[01:00:00] I wouldn't say fish oil is a nootropic, but

[01:00:02] **Dr Katie Hirsch:** yeah.

[01:00:02] **Dr Mike T Nelson:** Maybe a certain like calling sources or things like that, or what do you look at?

[01:00:06] **Dr Katie Hirsch:** Yeah. I think those are ones, worth a discussion. Even some of you are just like stretch. Moderators. So can we use something like an Oshawa Ganda to just try to help you regulate a little bit?

[01:00:19] Have been hearing some more interesting conversations of that. We don't have, I think, great. Like when is the best time to use that and really get the best benefits out of something like that. But for someone that's like chronically high, always pretty stressed. I think there's some interesting potential.

[01:00:37] Yeah, so I don't have any like straight go to's all the time, but I think it's always worth a conversation.

[01:00:45] **Dr Mike T Nelson:** And as we wrap up here what is one of your favorite studies that you were involved in that either had a surprising result or you think just, there's a really cool study that no one really talks about enough.

[01:00:59] **Dr Katie Hirsch:** Gosh, I feel like I've gotten to do a lot of really cool kind of fun studies. Let's see

[01:01:08] **Dr Mike T Nelson:** You can name more than one if you want. It's hard to pick one. I know sometimes it

[01:01:11] **Dr Katie Hirsch:** is hard I think the one I always go to That kind of sent me down this whole like sex differences and women's health path It was like right when I started my phd.

[01:01:24] I think I was Yeah, just transitioning from master's to PhD and we were testing like a high molecular weight glucose supplement versus just your traditional sport drink supplement versus crystal light placebo. Right. And we were basically reproducing a study that had been done in males, but we were doing it all in female cyclists.

[01:01:46] And got all through the study, went to compare our results our outcomes. We were looking at things like like time trial, time to performance or time to fatigue some RER, standard stuff like that. And found no difference.

[01:02:05] Okay.

[01:02:07] **Dr Katie Hirsch:** Remember in that moment, I just really looking back on it, I think.

[01:02:12] Some of it, there's some things we could have done a little bit differently from a design perspective, but also just it's still bothers me sometimes of but carbohydrates should work. So why did nothing, nothing worked. And so that sent me down. So there

[01:02:27] **Dr Mike T Nelson:** was no change across any of the groups, right.

[01:02:29] Is that correct?

[01:02:30] **Dr Katie Hirsch:** Yeah. Basically it didn't matter. Yeah, and so that sent me down a pretty big rabbit hole to just think more about like why Might have that happened What was going on all the way? Basically what I discovered through that is there was no research on Women and carbohydrate intake and years later now they've come up come out with Reviews that show that and they've actually quantified it and studies on women and acute and chronic carbohydrate intake are very few and far between.

[01:03:08] And so there is just this big lack of. data. And that's across sport science, that's across sport nutrition, that's consistent, but that's, I think, was an original impetus that sent me down this pathway of, at the time, then a lot of people there wasn't this great push behind women's research.

[01:03:27] So, the way we handled it then was, We're going to include both and we're going to make sure we have an equal amount so that we can at least explore if there was a difference. And if we're seeing a trend in any kind of direction that would justify okay, moving to an all female group or even an all male group.

[01:03:47] It was just at that point are we seeing any kind of difference or deviation? And then yeah, I would say just in the last four to five years. Have been able to really shift to all the women's health. And I think yeah, a lot of the stuff I got to collaborate on during my postdoc while I was in Arkansas.

[01:04:07] Still with Abby but learning about muscle protein turnover with Arnie really has driven my interest moving forward and realizing how much is going on during that perimenopause period and how very little we know. And so being able to combine both of those worlds was really cool and is a driver for where I'm going now.

[01:04:29] So I feel like that's why I love doing what I do is I've gotten to work with all kinds of participants and people, college students. We did all the like supplement type studies with just the healthy college kids. I've done up to, like older individuals with knee osteoarthritis. They were a fun group to work with, do stuff with.

[01:04:51] I've done just overweight, obese individuals of all ages. So I think that's, a big part of why I love studying what I study because Yeah, we get to work across that lifespan, which is really cool

[01:05:07] **Dr Mike T Nelson:** yeah, what I also liked about your background is that it's you know, obviously i'm biased because i'm exercise fizz, but It's very much to me like my air quotes or the old school exercise fizz where you work with different populations, you try to figure out, maybe one aspect of protein metabolism or supplements or, not just only women's health, which isn't a bad thing, but again, you like all things, whether it's male or female, you have to look at the entire organism that's in front of you.

[01:05:33] How is it responding? How is it? Working and I think having that broader background, I think just allows you to ask better questions overall. To get to a better answer and to see, is there really any difference between the two and if there is, where does it matter? Where does it not matter? What can we learn from it?

[01:05:52] **Dr Katie Hirsch:** Yeah, absolutely. I think there's, yeah, things to take from all of it and well, we saw this here and does that tell me something about over here? For sure. I very value, I've. I've gotten a pretty unique spectrum of experiences which I draw from all the time in different scenarios. So, yeah, very grateful for those experiences.

[01:06:11] Gotten to work with some really cool people.

[01:06:14] **Dr Mike T Nelson:** Do you think there is a difference in carbohydrate supplementation between males and females?

[01:06:19] **Dr Katie Hirsch:** Great question. I

[01:06:20] **Dr Mike T Nelson:** was hoping you wouldn't ask me that. That,

[01:06:23] **Dr Katie Hirsch:** At some point I'll rip that study, not that study, apart. I have, yeah, I'm waiting on at some point I would like to do it again. Maybe look at some different things a little bit further. I don't think there's a difference in like I never want the message to be like carbs don't work for women.

[01:06:41] I'm always a little afraid when I talk about that study, but that's going to get misinterpreted and that's not the interpretation. I think it just becomes more of a difference of there does seem to be maybe a little bit of a difference in Like glycogen recovery

[01:06:57] and

[01:06:58] **Dr Katie Hirsch:** women just being a little bit slower, needing more energy behind it.

[01:07:02] A little more longer time

[01:07:03] **Dr Mike T Nelson:** windows, I think if I remember right, like a four day study versus a two day, something like that.

[01:07:08] **Dr Katie Hirsch:** Yeah. We were looking at a within day design. So when you consider like I did this exhausting bout of exercise, I took this carbohydrate and we just gave them hours to recover.

[01:07:21] And now knowing, okay, women re synthesize that maybe a little bit slower, that maybe what we were seeing is that just still wasn't enough time, which is still a valuable. input, right? So what does that mean now for a tournament situation where we're trying to fuel women through all of that? And so I think that's where questions of doing carbohydrate with a little bit of protein with it knowing that, okay, if glycogen is depleting, is that pushing a little more fat and protein with it?

[01:07:55] And can we just help offset some of that? All of that? Does that There's some evidence that protein might help with some of that resynthesis. I don't know if that's been fully explored in women. Probably not. So I think there's still a lot of questions of like, how could we do that better? And is it just a matter of.

[01:08:18] Adjusting ratios a little bit to maximize that. Or, yeah, do we need to explore some other options? Is it a, you got to get it in a certain like we talk a lot about whole food sources for supplement sources. So I think there's a lot of potential there still to have. How do we. Do that best for women.

[01:08:41] **Dr Mike T Nelson:** Awesome. And thank you so much for your time and where can people find you? I know you have some social media.

[01:08:46] I don't know if your lab area is looking for any graduate students or people want to learn more, give us all the info.

[01:08:53] **Dr Katie Hirsch:** Yeah, absolutely. I am not the most active on social media, but I maintain a presence. Yeah. You can find me on Instagram. Or Twitter just search my name. It'll come up, you'll find me. And then always, yeah, my email, you can find me on our University of South Carolina website and always open to interest and having those conversations, so.

[01:09:16] Absolutely.

[01:09:17] **Dr Mike T Nelson:** Awesome. Well, thank you so much for all your time and thank you so much for doing some really cool research. I know you've got a bunch of stuff in the works and once you have more studies coming out, we'd love to have you yeah, I really appreciate all your time. Thank you so much.

[01:09:32] **Dr Katie Hirsch:** Yes. Thanks so much for having me.

[01:09:35]

[01:09:35] Thank you so much for listening to the podcast today.

[01:09:38] Really appreciate it. A huge thanks to Dr. Katie Hirsch for coming on the podcast. Big thanks to her for all of the wonderful research she's been doing for many years now. And it's great that we're actually accumulating more data to see what are the actual differences between women versus men?

[01:09:55] Should they be training differently? What should they do? As we talked about on the podcast, of course, there are differences. But unfortunately right now, there isn't as much research as what we would like to try to determine. What are those differences, and when and where does it really matter? And I know a bunch of other researchers are working on this question, so we will have more data, but it's going to be a slow process because science is a slow, stepwise process.

[01:10:26] So check out all the wonderful stuff that she has. Really appreciate her time. If you want to know her top four interventions for women go to MikeTeenElson. com forward slash Flex4. That's F L E X, the number four. And you will have those sent directly to your inbox. It also puts you on the insider newsletter list.

[01:10:47] So if you're already on the newsletter list, you will get the Flex4 for this episode delivered directly to you. So big thanks to Katie. Katie. If you're looking for exogenous ketones check out my friends over at Tecton below. Full disclosure, I am a scientific advisor there and an ambassador. I use the code, Dr.

[01:11:08] Mike, save some money there. So thank you so much for listening. Really appreciate it. We'll talk to all of you next week. Got some really cool episodes coming up stuff related to ketones. Breathing and the nervous system. We've got Joel Jameson talking about HRV coming up. Dr. David Church talking all about protein metabolism and some very cool studies there.

[01:11:35] And a bunch more. So, stay tuned for that. Thank you so much for listening. Really appreciate it.

[01:11:41] You suppose they have any life on other planets? What do you care? You don't have any life on this one!

[01:12:05] Always seek the advice of your physician or other qualified health provider before taking any medication. Or nutritional supplement. And with any questions you may have regarding a medical condition, never disregard professional medical advice or delay in seeking it because of something you have heard on this or any other podcast reliance on the podcast is solely at your own risk information provided on the podcast does not create a doctor patient relationship between you and any of the health professionals affiliated with our podcast.

[01:12:32] Information and statements regarding dietary supplements are not intended to diagnose, treat, cure, or prevent any disease. Opinions of guests are their own, and this podcast does not endorse or accept responsibility for statements made by guests. This podcast does not make any representations or warranties about guest qualifications or credibility.

[01:12:50] Individuals on this podcast may have a direct or indirect financial interest in products or services referred to therein. If you think you have a medical problem, consult a licensed physician.