

[00:00:00] **Dr Mike T Nelson:** Welcome back to the Flex Diet podcast. I'm your host, Dr. Mike T. Nelson, and on this podcast, we talk about all things to increase muscle strength and improve body composition, all without destroying your health in the process within a flexible framework. Today on the podcast super excited to have Dr.

[00:00:22] Jorn Trommelin talking about his brand new study that was published from his lab with Dr. Luke Van Loon and a bunch of other co authors about a hundred gram dosing of protein. What were some of the very cool effects that they saw. I'm super stoked to have him on the podcast so we can dig into all of the details there.

[00:00:48] I wanted to let you know that You can get his top four thoughts and actions about protein. You can get that exclusively at MikeTNelson.com/flex4. That's MikeTNelson.com/FLEX and the number four. So you'll be able to get that as an exclusive for being on the newsletter, on the insider list there.

[00:01:15] If you're already on the newsletter. Then you will be able to get this delivered directly to your inbox. So that little expert there will only be available at MikeTNelson.com/flex4. However, you'll be able to listen to the entire rest of the podcast here I also wanted to let you know that the flex diet virtual metabolism summit It's coming up very soon, it's going to be February 9th through the 11th, 2024.

[00:01:46] We'll have a link for this below too, it's www.flexdietsummit.com So I am organizing this. And it brought together over 30 of my favorite people from the industry as a collection of coaches, trainers, researchers, all talking about different aspects of metabolism and how you can use that to add muscle, increase your performance and improve your body composition.

[00:02:16] Everyone from Allie Gilbert, Luke Lehman from Muscle Nerds, Rick Collins, Leigh Boyce, Andrew Coates, Dr. Lonnie Lowry, Dr. Sue Kleiner, Dr. Lisa Lewis, Tony Gentlecore, and 30 plus other people. It's free to sign up the weekend of February 9th. Through the 11th, you will be able to get access to all of the talks for free.

[00:02:41] We will have an upsell there if you do want to buy them to download. But you don't necessarily have to just go to [flex diet summit. com](https://flexdietsummit.com) opt in there. And you will be able to see all the talks for free coming up February 9th through the 11th, 2024. And last one here my favorite electrolyte is from LMNT.

[00:03:07] So I've been drinking at least two of these for many years now. And what I've noticed is just overall my energy level feels better. It's just much more consistent and the problem before was I just literally wasn't drinking enough water because I don't know I don't really like plain water all that much.

[00:03:26] Yeah, I could force myself to do it for a few days But I didn't really stick with it And what I also realized is if you're eating mostly real food, which is what I do most the time when I'm at home then Paradoxically wasn't getting enough Sodium, which I know seems like a weird oxymoron, but getting more sodium and more electrolytes and having a lot more fluid I just noticed a big difference and just total energy level was much, much more consistent one day to the next especially since I'm going to be flying out to Canada for a ski and snowboard trip, which I'll probably be on by the time this is out.

[00:04:02] Having that on the plane makes a huge difference. I've noticed too. So if you're interested. You can get a free gift also, go to drinkmnt.com/mikenelson. Drinkmnt.com/mikenelson. So that is an affiliate link. So I do get paid a few bucks from them, but I love their product.

[00:04:25] I've been using it for many years and it works really well. And if you don't like it, you can actually return it. They'll give you a full refund. No questions asked. So on to the podcast today with Dr Jorn Trommelen talking all about the 100 gram dosing study of protein. He is a researcher over in Dr.

[00:04:45] Luc van Loon's lab in the Netherlands. He's published lots of great work looking at different aspects of protein, especially with overnight protein feedings and other studies. And he's a fitness bro, which is great. Because he has very good ideas about what things should be tested and he gives us a breakdown of the study.

[00:05:06] Should you be taking in 100 grams of protein? What are different markers for autophagy in the study that they measured? We talk about the building up a protein or what's called the anabolic response or muscle protein synthesis and then also the breakdown side of the equation and Shocker what you've probably learned online about muscle protein breakdown most likely is not true And we talk all about that.

[00:05:32] So enjoy this podcast with Dr. Jorn Trommelen

[00:05:38]

[00:05:39] **Dr Mike T Nelson:** back to the Flex A Diet podcast. I'm here today with Dr. Jorn Trommelen. How are you doing, sir?

[00:05:46] I'm good. I'm good. Thanks for having me. Yeah. Thank you so much for doing this. I assume all is well. You're still in the Netherlands. Is that correct? Yep. Beautiful weather there? Or is it overcast this time of year?

[00:06:00] **Dr Jorn Trommelen:** Usually it's pretty pretty raining. Pretty rainy. It's not too bad right now, but it's you won't invite people here for the weather.

[00:06:09] Let's put it

[00:06:09] **Dr Mike T Nelson:** like that. Nice. And wanted to chat today about the cool study you did looking at 100 grams of protein. And before we get into that, like, how did you get into researching protein? And especially at the lab you're at there with Dr. Luke Van Loon.

[00:06:33] **Dr Jorn Trommelen:** The short version was I started very briefly at math university found out after two weeks, I can probably do this, but is this fun? Only after, after seeing do I really want to do this for the rest of my life? I started thinking about a career I was like, okay, I'm always trying to read about fitness and nutrition. Let's do something with that. So start studying nutrition slowly started reading more and more stuff online.

[00:07:04] Start starting trying to understand. Studies. Like I remember the first time I read an abstract and I was like, what is this weirdly formatted text, but it sounds cool eventually found out that we had a pretty good lab in the Netherlands dark my way into there. And that's how everything

[00:07:21] **Dr Mike T Nelson:** got going.

[00:07:22] No, that's awesome. Because I know you've been into the fitness side and even the research side for quite a while, I remember reading, some of your other articles you put out and obviously you've done other research too. So what made you think that. More on the protein side of, okay, I'm going to, because the people, for listeners who are listening, like when you do a PhD, you have to pick sort of a skill set and a thing that you want to be known for, especially at first.

[00:07:46] And then maybe you can broaden out from there. A lot of people don't, but what kind of made you look at a protein as one of the items?

[00:07:54] **Dr Jorn Trommelen:** Yeah, I was very lucky. So you mentioned professor Van Loon, who is like probably the world champion in getting research funding.

[00:08:01] **Dr Mike T Nelson:** So I got to try. Oh yeah. You've done so many cool studies that are so expensive.

[00:08:08] **Dr Jorn Trommelen:** Yeah. So I I got to try a few things, a little bit of carbohydrate metabolism with more endurance, a little bit of resistance training and protein. And honestly, what. I always liked the protein more because especially when I was younger, I was like more into let's build muscle. Let's look good.

[00:08:26] But as I was doing the research I remember that one of my first studies like got pretty heavily challenged by a reviewer and I was like but because before I was like a simple bro, I just wanted to know how much protein layer casein, give me the answer, move on. So yeah. When I, when with one of my first papers, I got pretty challenged by one of the reviewers like on a very methodological, like how are these measurements working aspect?

[00:08:55] And I was like okay, I'll read into it. And pretty soon I figured out I don't think this review understands how this works. And then I just started realizing, Ooh, I think in our field, there's a lot of bros like me, you just want way versus casing, and there's very few people who actually understand the methodology.

[00:09:13] So I figured out my talent. It was just yeah, it just came easy for me to do maybe it's because my background in the math university, that is what I gravitated for. So I saw that a lot of models that were used in the field were just a suboptimal. Started improving them and therefore yeah, could you cooler studies and new opportunities

[00:09:34] **Dr Mike T Nelson:** came up?

[00:09:37] Yeah. And that's one thing I think people. Don't realize is that when you pick one area by definition, you don't do a lot of other stuff. Like I ended up looking at a heart rate, variability of metabolic flexibility. When I moved to the exercise physiology department, literally because no one else in the entire department, even my advisor understood any of the math.

[00:09:57] And so I did a master's in mechanical engineering, minor mathematics, the math really wasn't too bad, but then you realize, oh why would

they understand it? They haven't taken any advanced math. This is not part of the curriculum. So I think those kinds of overlaps of areas, especially when you get into creating physiologic models and things of that nature are.

[00:10:17] Interesting when you have the skillset to look at both sides. Yeah.

[00:10:21] **Dr Jorn Trommelen:** So two things come to mind. So the first one is of course you have to specialize at the higher level you get, the more you have to specialize. Do you want your wedding photographer to be someone who says, Oh, I shoot.

[00:10:34] Photos of babies of weddings of well, things are like, all I do is make wedding photos. That person probably is better than the average random photographer. So it's the same with science. If all you've been doing is protein studies for the last 10 years, you probably have some good ideas of what to do next.

[00:10:53] But what I think, let's call it. The fitness people are pretty good at in general because it's so practical. I feel that most. People who have some overlap with nutrition and exercise, on average, they are pretty interested in other things. So it of course depends, like you have the truly hardcore scientists, but there, I think there are a lot of people who's for example, protein is their main field, but they know quite a bit of, quite a bit of most macronutrients, most supplements for example.

[00:11:25] But yeah, someone who claims who is the world expert at everything is. Probably nowhere near in any of that.

[00:11:32] **Dr Mike T Nelson:** Yeah, there's a lot of, let's say, self proclaimed experts online and usually those are the hilarious ones where you'll put up some huge study and they'll have some just weird comment and not even like asking a question.

[00:11:47] And it'll be like Oh so for example, like some of the studies you did early on in Luke Van Loon's lab was looking at basically a tracer labeled casein protein, looking at it for, overnight sleep. And you talk to him and he's yep. And we woke him up in the morning with muscle biopsies and just this whole intricate study that took forever to get done.

[00:12:07] And then you have all the bros online that are like, Oh, they use casein because casein is this low acting protein and. It's they did it as a

practicality because you can only get the tracer into the case scene and the way would be just ungodly expensive, which I think was actually done later.

[00:12:22] But so you see all these kind of criticisms of people who've never done research or even bothered to hey, you could maybe ask the researcher, hey, why did you pick this? Because there's probably a pretty good reason they did it that way. And it's not because all of them are. And Apton don't know what they're doing either.

[00:12:41] That's my pet peeve.

[00:12:43] **Dr Jorn Trommelen:** It's there's two things. So some people they like to dunk on studies and or researchers, because if they can show online that maybe there's some small limitation, then clearly they must be smarter than the researcher. While in practice, the answer usually is I would love to do it.

[00:13:02] It's just not possible because of reason X. Nine out of 10 times reason X is more money,

[00:13:08] **Dr Mike T Nelson:** money. Yup.

[00:13:10] **Dr Jorn Trommelen:** Why didn't you have a third group who did this? Oh, I never thought

[00:13:14] **Dr Mike T Nelson:** of that. Never entered my mind, man.

[00:13:16] **Dr Jorn Trommelen:** But at the same time like the natural tendency of people Oh, that's a cool study. Hey, if you would change this, what do you think would happen in that scenario?

[00:13:27] That is super good. But it's all how they bring, it's like, why did you do it like this? You should have done it. That is just horrible. But if they're like, Hey, what do you think would've happened if you had a different type of protein? Yeah. Would you expect the same? And why? That is just useful debate. So it's really a hit or in hit or miss depending on how they phrase

[00:13:46] **Dr Mike T Nelson:** it.

[00:13:46] Yeah. And if anyone's ever done any research and you just realize how long this stuff takes and how expensive it is, and even when I just said in energy drinks, people were like exactly. Why didn't you have a third group that was, no caffeine or this, or why did you use this placebo?

[00:14:02] One of them was, time and money, and also, I'm trying to get these volunteers, I wasn't able to pay them anything. So they're already doing four max tests in the lab. If I had another group that's a fifth max test, if they drop out with that design, I can't use any of their data. And I'm just like trying to get this thing published and, get my PhD and get the hell out of here.

[00:14:22] So it's yeah, it's a great idea. It's a very valid question, 100 percent agree, but in practicality, you have to see that the study gets completed also, or then you're left with nothing and, the study blows up, your power goes to crap, and you're like, oh man, I gotta start over again.

[00:14:37] So you're always kinda, like you said, weighing these options of, what's gonna kinda incrementally move it forward, and then hopefully, maybe you can come back, you can, readjust things in future studies too.

[00:14:49] **Dr Jorn Trommelen:** The favorite one of let's call it fitness people. I think we classify as that, but I think it's clear what I mean is there.

[00:14:56] You should do it in train people. I'm like, I would love to go to the lab. I'll take your biopsies. When are you coming? Yeah. You never hear of them ever again. So it's like I mentioned, like when I started out, I was exactly the same as everyone online now trying to read these studies.

[00:15:12] I was just, fortunate that I could sneak my way into the field, but I have the same goals and I want to do the same studies day all I want to do I just unfortunately. Run into the actual limitations. And it's no longer just Oh, this will be really cool. No, I know, unfortunately, what it's, what it takes to do it.

[00:15:33] It's not

[00:15:33] **Dr Mike T Nelson:** easy. Yeah. The strange subject thing is. On one hand, yes, it's a great question because we obviously have some data showing that train responses is different, but anyone who's ever tried to recruit trained subjects, it's like good luck. Like I've often joked, like I was at the University of Minnesota and Cal Dietz is a good friend of mine.

[00:15:52] I've often joked with him that I'm like, okay, Cal, if I came over and said, give me a 12 weeks of your top athletes, I'm going to have them do one protocol, this and another protocol that he'd be like, Get the hell out of my gym. What the hell's wrong with you? Because his job is to take these athletes and to get the best results possible.

[00:16:11] His job isn't to help me complete my Ph. D. research at potentially the detriment of messing with his athletes. So it's it, I get it. It's a good question, but it's so hard. To get trained subjects, to get approval, what kind of study you're doing? How long is it? All those things just make it very difficult to do.

[00:16:30] **Dr Jorn Trommelen:** Yeah, honestly, that's just one of the many limitations of trail. There's so many, like by definition, they all have a different training state, like untrained, everyone is more or less the same. So that already makes it more difficult. But then the one thing that most people don't seem to realize is.

[00:16:46] Let's say you have two things, you compare two different types of protein and one gives double the gains of another one in untrained people that, that double the gains is maybe one kilogram versus half a kilogram in untrained people. That is like a hundred grams versus 50 grams because they're no longer gaining.

[00:17:05] So even if something is twice as effective, you don't see it in trained people anyway. So there's so many limitations that people don't think I was like, of course we want to do studies and train people, but unless the government gives me money to do at least a year long study, which they would never do because why would they you're just not going to see any difference because everything progresses so slowly.

[00:17:30] **Dr Mike T Nelson:** In them. Yeah. I agree. And, cost and money and where are you getting these athletes and how are you messing with their training program? Like most high level athletes are like, yeah, maybe a few non invasive things, but no, I'm not doing your special secret squirrel research program for 12 weeks and have you stuff needles into my legs six times.

[00:17:51] That sounds horrible. I'm out. I'm out. I'm

[00:17:53] **Dr Jorn Trommelen:** out. And neither should they, like they're professional athletes and not guinea pigs, but so yeah, again, it comes down to we should try to do what we can and we should hypothesize together with practitioners, other researchers as much as we can. But this whole idea is like, Oh, these researchers live in their own world.

[00:18:13] No, we don't. Like most of us started out the same as everyone else. We just ended up with a science job.

[00:18:20] **Dr Mike T Nelson:** Yeah. So how'd you get the idea to look at a hundred grams of protein in a single feeding? Because I think, was it the highest amount that I remember beforehand? I think Rob Boleslav did something with 60 or 70 grams.

[00:18:35] And I remember the internet lost its mind at that point. And now a hundred grams. Oh my God.

[00:18:41] **Dr Jorn Trommelen:** Yeah we might get back to the Bob Wolf study, but basically, so the advice has been for quite a while that you need about 20 grams of high quality protein in a meal to maximize muscle protein synthesis, which is the process that drives muscle adaptations, which can be hypertrophy, but can also simply be remodeling.

[00:19:01] And if you eat more your body can't really use it. So you oxidize it, you burn it as a fuel. And that principle, that, that has been replicated in various studies, including one of our own lab. So I've given a lot of talks where I basically said that advice Oh, you need about 20 grams protein in a meal.

[00:19:24] But over, Oh, and that, that kind of, that data is like the main argument. for protein distribution. So how you distribute your protein throughout the day. So the idea there is that if you eat 100 grams in one meal You can really only use about 20 gram of that and most of it gets oxidized, basically wasted.

[00:19:46] So it's much more efficient to have about 20 grams, couple hours later, again, have 20 grams. And then your total utilization of the protein is much higher. If you actually look at long term studies who measure changes in muscle mass in response to different protein distribution patterns. Most of them don't see a difference here and there.

[00:20:09] Sometimes it looks like protein distribution maybe is a tiny bit better but the effect is disappointing at best if there's even an effect. So that was one of the data points where it's like. These acute studies and these long term studies don't seem to match.

[00:20:29] **Dr Mike T Nelson:** My normal long term studies was that dose equivalent or was that looking at just frequency changes?

[00:20:36] **Dr Jorn Trommelen:** Yeah, usually they just give a certain amount of protein so let's say 80 grams of protein in a day, which we would consider low depends on the exact study. And then they gave it either in three meals or in

six meals, or sometimes it is three meals, but there are three balanced meals or one meal with almost everything or the most extreme example, which really started.

[00:21:02] started me questioning this protein distribution yeah, hypothesis was the intermittent fasting or time restricted feeding data. More and more studies came out where if people ate, for example, all their food, including protein in about eight hours which is horrible from a protein distribution point of view, they didn't lose more muscle mass than the control group who had a much better protein distribution.

[00:21:31] And that is a very extreme, like I can imagine four or five meals. Yeah. That might not be that big of a difference, but if you put everything in one third of the day, like theoretically two thirds of the day, you're catabolic. If you don't see an effect of that, Why are we even discussing four or five meals?

[00:21:52] If the approach, if you don't see big changes there, I'm like, so that was one data point. Probably the most convincing. I'm like, I think maybe something in these acute studies might not add up. That's honestly, that's not true. Eventually I came to that conclusion in beginning, I taught.

[00:22:12] All these studies are just underpowered. There's a little bit of what we just discussed is if you just have a handful of subjects in a study and you measure them for 12 weeks, even if one group loses muscle mass twice as fast or gains is twice as fast as another group. You don't really see a clear trace okay, both groups stayed more or less the same.

[00:22:32] No significant difference. So I thought. we probably need 30 of these studies and then we can combine the data in a meta analysis, and then you'll start seeing that the protein distribution has an advantage. But as more and more data started coming in, the patterns start looking worse and worse.

[00:22:51] It just didn't really seem that protein distribution had any benefit at all. So that was the first point I'm like, Oh, maybe there's something wrong in these acute studies. So very quickly. My bad beef is when people say Oh, these are cute studies. They don't always translate to the long term stuff.

[00:23:11] It's that exact phrasing because someone has said it and other people are copying it. Like word for word, it's always that exact.

[00:23:18] **Dr Mike T Nelson:** I didn't even know what they're saying most of the time. It's just like something they just throw out at this point. It's okay.

[00:23:23] **Dr Jorn Trommelen:** So the underlying logic I'm not disagreeing with, but the point is, if you come to the conclusion that any two types of research don't add up.

[00:23:31] First of all, you don't know which one is wrong because initially my reaction is it's probably the long term it's not sensitive enough. You need much bigger subject numbers. If two types of research don't add up, the only logical conclusion is we're missing something. And until we figure that out, we have no clear.

[00:23:51] understanding. So just saying, Oh, the acute must be wrong is just so simple minded in my opinion. Anyway, it does, it did seem that the results from those two lines of evidence were contrasting. Then like this is not a very convincing argument to me, but I found it interesting. If you look at some animal literature, most notably in snakes, they can eat like 25 percent of their body weight.

[00:24:18] So for. A reasonable bodybuilder. That's like a meal of 20 to 25 kilograms. They can eat that and they are just digesting the meals for two weeks and protein synthesis stays elevated for two weeks. So I'm like, okay, at least somewhere in biology, there is the opportunity with large amounts of protein.

[00:24:42] Not everything gets oxidized, wasted. At least some animals have the capacity with one meal to just stay anabolic for very long. So then I went back to the acute studies, have we tested that principle in humans? And the answer was really like, not really, because what usually happens with these studies.

[00:25:02] As they do a study. Usually exercise and then they give different doses of protein and then they measure muscle protein synthesis in all these dose response studies of they were four to six hours in duration. And that seems pretty reasonable because typically after four to six hours, you have your next meal.

[00:25:25] So it seems reasonable. That's why I think it took a while before people in this case, me tried something else. But is it really fair? Because if we go back to that snake example, he's digesting his meal for two weeks. Now, of course we're not eating a 20. kilogram meal. But if you give a large amount of protein are you sure that it's fully digested and absorbed in that four to six hours period?

[00:25:53] Because if it isn't even digested, then it cannot even reach your muscles, cannot possibly be built into your muscles because it's still in your gut. And then the last piece of data. Was long time ago. I remember it. I just woke up in the middle of the night and I had a meat burp. I just felt I was still digesting food.

[00:26:15] And it's Oh, that's true. I had a barbecue earlier back then, especially I was like a really, I was a bro. Protein as much protein as I can. And I was like, holy moly, like this meal was like 10 hours ago and I still feel I'm still digesting the food. So I basically put all those things together and my hypothesis was if you consume a large amount of protein the studies so far have not really seen the added value because the added value is not in the first four to six hours.

[00:26:45] It's mostly. The hours after that, but no one has measured in that period. So that was the basic

[00:26:52] **Dr Mike T Nelson:** hypothesis. Oh, that's great. And yeah, the acute versus chronic is always, it's an, it's one of those things where it's yes, it's a good question. I remember talking to Stu Phillips about this too. And his point is, some of the data matches up, but he's people don't realize the cost of doing a chronic study, the amount of time that's involved.

[00:27:13] And you also have to justify. What are you going to study chronically? It's not like everyone has an unlimited budget and unlimited time just to pick things out of thin air, so yeah, we're going to look at acute response, and then of course the next question is that acute response, does that transfer to be a chronic study?

[00:27:29] But you have to start somewhere to have some data, to have some idea of what you're going to look at in the chronic studies. You can't just go out willy nilly and just start doing chronic studies all the time either.

[00:27:41] **Dr Jorn Trommelen:** That is terribly inefficient, and our lab does both, so it's not like we have reference for either.

[00:27:48] But like every method has its pros and its cons. So a simple example, I can give you three liters of water and it will have zero impact on your muscle protein synthesis. But if I give it to you in a longterm study, you've gained three kilograms of lean body mass. That's just because you're violating an assumption of your measurement tool, which is that hydration stays the same, right?

[00:28:11] So Instead of saying, Oh, this type of research or even observational or animal is completely useless. No, what are the strengths? What are the weaknesses? And again, unless you have a pretty good understanding of all lines of research, and if they don't add up, have a reasonable idea of maybe why, and then do a study to try to unite these fields You're just a one trick pony and you're like, Oh, anything that doesn't fit my biases do.

[00:28:40] It doesn't add up. Your job is to understand why and just dismissing stuff that you don't like is the easiest thing, but it's just, don't claim you're evidence based. You're just like. Confirming bias is

[00:28:52] **Dr Mike T Nelson:** based. Yeah, and that's what a lot of people do when they go to PubMed. It's I just want to find the five studies that agree with, my little talking point.

[00:29:01] And the other part that's also hilarious is you get new research. You're actually literally doing the new research. And then you get a lot of the parrots who are like, I knew this was true all the time. This is what I've been saying for years. It's bro, you haven't been saying that for years.

[00:29:16] **Dr Jorn Trommelen:** So that one is always is funny to me because like this study, I had this hypothesis about eight years ago and then first I had to find the money and I had to do this study, et cetera, et cetera. So just having an idea is worth nothing. Like it's nice that you had it's great if you were an athlete and you have an idea and you try it and it seems to work for you, that's good.

[00:29:36] But from a scientific point of view, unless you've shown it. It's just an hypothesis. So to say, I knew it was true is just it doesn't help anyone because for everyone who says, I knew a ketogenic diet is superior for fat loss. There's another person who says the exact opposite. So it's from a scientific point of view saying that, it is just not worth a thing.

[00:30:01] And even if you're right. In science, we like to quantify, okay, let's say that a ketogenic diet is better. How much benefit can the average person expect, et cetera, et cetera. Yeah, all I can say is good for you if you knew it, if you're betting average, like what I would see with what I would like ideally that those people, especially like if Just a fitness fanatic says it in their enthusiasm.

[00:30:25] I'm fine. I really dislike when the let's call it the fitness evidence based influence for people say like I've been saying that this new study confirms it. I'm like, where is your blog post? Yeah. Show me the evidence. My top 20 hypothesis. I want to see your betting average. Because you can't throw out 50

hypotheses and then when one gets confirmed saying I've been saying this all along, show me your betting average.

[00:30:53] **Dr Mike T Nelson:** Yeah. No I agree with that a hundred percent. And then back to the bubble study, was the fact that you used 100 grams, was it just higher than what they did in that study or do you want to talk a little bit about, because I know that study brings up all sorts of, I remember when I was at ISSN when that study was released and, got to talk to some of the researchers on it and it was crazy just to ask other, pretty intelligent science people about their opinion of it.

[00:31:17] And it was like, All across the board from this is amazing to this is the stupidest study ever. And

[00:31:25] **Dr Jorn Trommelen:** yeah, so I'll start with why why we picked a hundred grams. Remember that barbecue I said, I was digesting in the night. So we did a pilot, let's call it a study. I was just with our department.

[00:31:36] We had a barbecue. So me and another gym bro we were just like, okay, how much protein can we eat without Getting sick. Like how much would a gym bro eat? Who's Oh, protein. Awesome. How much would you eat? But not Oh I'm trying to get the biggest possible number just to have a crazy number and brag online.

[00:31:56] Both of us like good comfort. Comfortably eat a hundred grams, although it was like a little bit more than not the average person would eat it. You need to be a little bit of a gym bro. It's Ooh, protein.

[00:32:08] **Dr Mike T Nelson:** So we put some effort into

[00:32:09] **Dr Jorn Trommelen:** it. Yeah. So it's okay. A hundred grams is like the practical upper limit of what anyone would eat.

[00:32:14] Can you eat higher? Yes. But that would be a very small percentage of the population. So that basically it's what it came down to. We wanted to see what's the practical upper limit. If we quickly go back to the Bob Wolf study, so he compared 40 grams versus 70 grams of protein. That study also seemed to suggest like, Ooh, that old 20 grams of protein is not the optimal dose.

[00:32:39] I don't want to make this too too boring, but there are some methodological issues in that paper while why those results are pretty much an artifact. I'm actually working on a paper with professor Wolf discussing that.

But. Yeah. If you actually look at the study I've published now and his findings, they're like, they seem to have the same message that 20 grams is not the the same reason often, sorry, not the optimum, but the reasons are very different in his work.

[00:33:09] It seems that a whole body protein breakdown. So that's not specifically in muscle tissue. It can be break down in any tissue. That seems to go down with higher protein doses. If you look in my study, you basically see no impact on whole body protein breakdown with the protein. So it's completely different result.

[00:33:29] And that is because of the different methodology. So why did we see an advantage? Again, that is because the anabolic effect, so the higher protein synthesis, both on the whole body level, as well as in the muscle just last much, much, much longer. So he only measured for about three and a half hours from the top of my mind.

[00:33:48] He would have seen a huge benefit of that 70 grams compared to that 40 grams, not on protein breakdown, but on protein synthesis, if he measured longer But in the end, luckily, the overall message is the same. And while we're working on the methodological paper so slowly the field will move in the right direction, I think.

[00:34:09] **Dr Mike T Nelson:** Yeah. And talk a little bit about, we'll talk about breakdown first, and then the protein synthesis. Just as a background, most people know that your body is constantly using some amino acids. There is some in the bloodstream, but most of it is going to come from muscle tissue, but you're also depositing back amino acids into all tissues all the time.

[00:34:28] And if you go, and you've been around the bodybuilding space for a long enough time, there's this, I wouldn't say a myth, but it's rather prevalent about all sorts of things making you very catabolic from cortisol being, horrible to different training methods to all these different things. What are your thoughts about the average gym rat?

[00:34:50] Is muscle protein breakdown something they need to be super worried about or what are your kind of general thoughts on that?

[00:34:57] **Dr Jorn Trommelen:** The short answer is no, they don't have to worry about muscle protein breakdown. But of course, the interesting part is why. So it makes sense, right? If muscle protein synthesis is good, like building your muscles and the breakdown part seems to be the exact opposite.

[00:35:14] So it must be bad. But the thing is, what protein breakdown does for the most part, it's allows damaged proteins that's either from can be from training, but also just from metabolism from oxidative stress. You always will have damaged proteins to take those proteins, break them apart back into amino acids, and then rearrange them again in functional amino acids.

[00:35:39] So the way to think of protein breakdown is it allows constant renovation of your muscle. You always have healthy tissues. because it's constantly being renewed. So protein breakdown, like there's a reason our biology created protein breakdown. It is to keep our tissues healthy. And you can't do this in humans.

[00:36:01] So of course this is an animal work, but if you have a knockout models where various components of a muscle protein breakdown are. Basically removed. So the animal loses the genes for muscle protein breakdown. They become smaller and weaker and die earlier than normal mice. So that shows as a principle that protein breakdown is useful.

[00:36:24] So don't think of it as a bad bank account. Okay. You can think of it as a bank account. So yes. Income protein synthesis is great. That makes you richer, but spending money is that bad? It depends if you invest in something that in the net, in the long term, or if you invest in employees that can earn you more money, like it's an investment in the future.

[00:36:47] Protein breakdown is the same. You're removing your damaged proteins that gives you the building blocks to build. new functional proteins. More practical training increases muscle protein breakdown a bit makes sense. There's more damage. So you need to break those apart, make new muscle tissue nutrition inhibits.

[00:37:11] muscle protein breakdown. And the amount of nutrition you need for that is absolutely minimal. Like you need just a little bit of protein or a little bit of carbohydrates. Almost anything you'll eat will be enough of a signal for your body to have the maximal reduction in muscle protein breakdown that's possible.

[00:37:31] So even if you think whatever it is, dude is saying. Sounds bad to me. I'm still going to do everything I can to reduce muscle protein breakdown as much as you can. The answer is don't be faster. That's all you can do. There's no special techniques to further reduce it. So even if you think it's a big issue, again, it's not, there's nothing you can do beyond not being fasted to reduce.

[00:37:55] **Dr Mike T Nelson:** Yeah, I always try to explain to people thinking of things in terms of flux or flow that you want turnover is a good thing, right? As long as you have at the end result is moving in the direction you want. There's some old studies with I think it was knockout mice. So for a while I was looking at.

[00:38:14] insulin sensitivity and all this stuff and went down that rabbit hole of hey, can we just do things to just not put fat in fat cells? Would that make people leaner? And they actually did a study of knockout in mice years ago, and they found that the mice did get leaner, but what happened was the amount of nephel D and the amount of fat deposits in the liver, killed them off, like super early, like their lifespan was cut by 50 percent or some crazy number because if you can't take the fat and you have an excess and you can't stick it in storage in a fat cell, it just backed all the way up in the liver and caused all sorts of issues.

[00:38:50] So I just think you want more fat to deposit it in the fat cell, but you want to oxidize and burn it off the back end. You want to break down some muscle tissue, but you want to make sure you have a building up of that tissue at the same time. It's not this sort of static thing where if you just stop the outflow that everything's gonna magically be happy,

[00:39:09] **Dr Jorn Trommelen:** yeah. You can imagine, let's say that you don't break down your damaged protein. That's just like your muscle is growing and you're like, Oh, this is awesome. But if 80 percent of your muscle is damaged proteins, that sounds like a recipe to have muscle tears and like real injuries. It's sounds good.

[00:39:26] Prevent protein breakdown, but it's just. Thought a little

[00:39:29] **Dr Mike T Nelson:** bit too simple. And that leads into autophagy, which you guys actually measured some markers of autophagy, which the top of G feels like it's the new, yeah, it's also the boogeyman, but also the amazing saving grace of every longevity expert known to man.

[00:39:46] Do you want to talk a little bit about what it is and what you found in your study? And again, you're looking at some markers of autophagy.

[00:39:54] **Dr Jorn Trommelen:** Yeah. Like you mentioned, especially in the bodybuilding world protein breakdown was labeled as a bad thing because, you want to have a net balance, a positive net balance into muscle.

[00:40:03] So it must be bad in the longevity field in the last, I would say 10 years, they have developed a little bit of a. Pretty much the exact opposite view. Yeah. The idea is if you're always anabolic that reduces longevity and things like calorie caloric restriction help you live longer.

[00:40:23] And then they were like, okay, that's not really practical. Can we trick the body into thinking That's we're not always anabolic. And then the concept of time restricted feeding or intermittent fasting came up where you still eat quite some bit in your feeding window. And then you have, for example, 16 hours where you don't eat anything.

[00:40:43] And during that fasted period essentially your body is starving so there will be higher protein breakdown just as we as we discussed as, as long as you're, if you're not fasted, you've already did everything to inhibit protein breakdown and autophagy is just a subclass of protein breakdown.

[00:41:02] But the idea is that if you can break down those damaged proteins, that's just healthy. So you want to prevent the accumulation of damaged proteins. Now, so muscle people just think about their muscle, but then other people think like Alzheimer's is basically the accumulation of misfolded proteins in the brain, for example.

[00:41:22] So the longevity field, all they want to do is make sure that Damaged proteins don't accumulate, so they want to stimulate autophagy. And again, how do they do it? Either with very low caloric intake, so you're essentially starving, or with not eating for periods, time restricted feeding. So in this study, my hypothesis, because again, one of the reasons I did this study is like, these acute studies don't seem to align with Intermittent fasting, like they should be catabolic for two thirds of the day because they're not eating for 16 hours of the day, but not eating 16 hours of the day is not the same as being fasted.

[00:42:07] For 16 hours over the day, you're fasted when you've completely digested and absorbed your last meal. And my whole hypothesis was with that a hundred grams of protein, it's going to take forever until that meal is fully digested. So in this study, you actually found that with a hundred grams of milk protein at the end of 12 hours, which was how long we measured, the meal was still being digested.

[00:42:35] So this idea of we take the same amount of food. But we just eat it in a much smaller window, and then we're fasted in that other window. That is just not right. It just, your meal is being digested longer. So it doesn't really matter if

that same amount of food you spaced out. Maybe it matters a little bit, but just the ideas.

[00:42:57] whenever I finished biting on my last bite, now I'm fast. That's just completely wrong. And how long are you, how long are you still in a postprandial state after your last bite? It depends entirely on how much you ate and characteristics of that meal. But yeah, one of the things we measured during our 12 hour period was a lot of anabolism stuff, but we also wanted to measure that autophagy.

[00:43:25] It was just a marker but just a marker of autophagy. And what was really interesting is that with the a hundred grams of protein, Anabolism was sky high, like the highest values you can possibly get for 12 hours long. But the autophagy just, it didn't care at all. Like it was not that the hundred grams of protein, there was, had no difference with 25 grams of protein or even no protein at all.

[00:43:52] This whole concept that anabolism and catabolism are like it's one or the other and you either stimulate anabolism and you're dying faster or vice versa, that seems a little bit too simplistic. Now, a few disclaimers. That marker is one of the weaker markers in the study perhaps even more important.

[00:44:13] We measured that in muscle tissue that doesn't mean other that's the most relevant one for the bros, of course, but it doesn't mean that the let's call it the Alzheimer proteins are not accumulating in your brain, but at least, yeah, at least for muscle tissue, it's not if one thing is on, if anabolism is on, then all things scatabolism are off.

[00:44:37] And you know that it's a sliding scale. It's, they seem to be regulated pretty independently.

[00:44:44] **Dr Mike T Nelson:** Yeah. And people forget that if you look at how often most people eat, if autophagy was not working, my little IR quotes here. We would know that we'd find all these people with like misfolded proteins and it'd be like the garbage truck was never taken out of your body, right?

[00:45:01] It doesn't add up. Again, you can argue about what rate is it accelerated or not accelerated, but, as like exercise is one of the main things that'll massively upgrade, autophagy. And again, in which tissue, to what degree, what marker are you using? It gets messy real fast.

[00:45:16] It's not as simple as well, bro. If you don't eat autophagy is better. It's like

[00:45:22] **Dr Jorn Trommelen:** And I like I certainly don't want to put out the message That it's not relevant at all. I just want to give a different perspective again so far the communication is mostly is who be careful if you're like I quite regularly get emails like Hey, is there a drawback of eating too much protein?

[00:45:40] Because if you're always anabolic, then blah, blah, blah, autography, bad stuff. Yeah. I'm not saying it's not the case. Again, we only measured something. Issue. But it's definitely not as clear cut as the people who push the time restricted agenda are

[00:45:57] **Dr Mike T Nelson:** making it out to be. Yeah, and we'll link to a podcast I did with my buddy, Dr.

[00:46:02] Kurt, who did his PhD on autophagy and, yeah, it took us like an hour and 20 minutes to basically say eh, what we know is maybe not true and yeah, there's a whole bunch of unknown, which is, that's the process of science.

[00:46:18] **Dr Jorn Trommelen:** Yeah, my study is challenging a lot of views in my field, and I'm sure in that field views will come like that field is so young that will continue to develop and who knows where

[00:46:29] **Dr Mike T Nelson:** it turns out.

[00:46:30] Yeah. On the two questions on the anabolic side, you saw like probably one of the most robust and probably a highest Is it the highest response? I don't know of a response that was higher that I've seen. And then the follow up question is that related to the protein source that you tested?

[00:46:48] **Dr Jorn Trommelen:** It's it's a little bit difficult how to quantify how high it is because the way muscle protein synthesis is measured, it's very sensitive based on which amino acid tracer do you use.

[00:46:59] So I used

[00:47:00] **Dr Mike T Nelson:** multiple amino acid tracers. Yeah, I think you used like up to four, I think, wasn't it, yeah, in

[00:47:04] **Dr Jorn Trommelen:** total we used four tracers that we applied and I think we used, yeah, only two for the muscle protein synthesis and the other

one have other use cases. But basically what we. One is not that people say Oh, you saw with that amino acid, are you sure that applies to other one?

[00:47:21] We had different amino acids and there's so many ways to measure muscle products since we did them all okay, see the pattern is but that makes it difficult to compare to other data because. For example, if you measure over a four hour period, that was my first two biopsies were immediately after exercise and then before protein ingestion and four hours later.

[00:47:43] You can't really compare that to someone else who measured in the first two hours, for example. So I, generally I advise to not directly compare literature values, but if you just look at the patterns in the data. The patterns are smashing. The percentage increases compared to placebo were pretty much off the chart

[00:48:03] **Dr Mike T Nelson:** in the study.

[00:48:05] So do you think, and oh, before I forget, and what, remind the listeners, what type of protein you used in the study? And if you used a different type of protein, if you used a whey protein, do you think you would see anything different? Which again is, kind of speculation at this point.

[00:48:19] **Dr Jorn Trommelen:** Yeah, so we used a milk protein.

[00:48:22] For various reasons. So one is that you already alluded to. We used a very fancy method where tracers go into the protein, very expensive to produce. The ideal way to do that is with a cow, which just has the highest efficiency. And then with that milk, you could separate it in different types of protein.

[00:48:41] For example, the fast digesting whey protein that most people get a no or the slow digesting casein protein, but then you're left with less total product. And we needed all the protein to give as many people, a hundred grams of protein as possible. So that's one of the, one of the reasons why we took milk, just the most cost effective approach, but a more important reason is that.

[00:49:05] In the Western world, milk protein has the largest contribution to protein intake. I knew like this is a question that everyone should always ask, but I knew this question would be asked does this translate to other proteins? I don't know what other protein, what other proteins should ask the question.

[00:49:24] Does this translate to milk protein? Because milk protein is the largest contribution. Nevertheless, the question is, does that? Is it still a weird

exception? Yes or no? And then I've seen the comment like, Ooh, milk protein is 80 percent casein. That's slowly digestible. So milk protein is quite slowly digestible.

[00:49:43] Does that reflect other proteins? Depends. Yes. Milk and casein protein are slowly digestible, and that does not reflect most isolated proteins like whey protein or a soy protein powder. Most people don't eat that. Most people eat mixed whole food meals. Of all the isolated powders that you could use, We used one that most reflects mixed meals.

[00:50:10] So yeah, I don't think we could have picked not to pat myself on the back too much, but I don't think it's a more relevant protein sources, the largest contribution and the one that most resembles mixed meals. Now, maybe your question is like, why didn't you pick mixed meals? But that becomes very complicated.

[00:50:30] What's the intake? What's the impact of the different caloric balance? How are you going to compare that between groups? Here we really wanted to show that protein on its own can keep you anabolic for many hours.

[00:50:43] **Dr Mike T Nelson:** Yeah, and I believe that the protein you use, you actually put the tracers in the feed, which is given to the cow, which then produces the milk protein, which then has to be isolated, which then has to be given to humans, correct?

[00:50:57] **Dr Jorn Trommelen:** Yeah, it's almost correct. So we don't put it in their food. Although you could do

[00:51:01] **Dr Mike T Nelson:** that. Oh, okay. Use it in the cows. Oh, it's an infusion.

[00:51:04] **Dr Jorn Trommelen:** Okay. Gotcha. Because it's slightly more efficient, but so just so that people understand we have this let's call it a, it's an amino, it's just a regular amino acid.

[00:51:14] The only functional. Difference is that it has like a chemical flag that has no label on it on your, yeah, on your physiology. But because of that flag, we can follow it throughout the body. So I have here, the bottle of this stuff, then I have fused it in a cow. And I don't think people realize cows are gigantic.

[00:51:34] So I have this little bottle of stuff. I infuse it in this enormous cow, only the amount that ends up in the milk, because the cow is going to use that

amino acid. It's going to use it for his muscle, for his brain, his liver, for everything. Only the part that gets in the milk is her net yield. Like everything else is essentially lost.

[00:51:55] Then from that milk, we make Protein supplements. We give that to the human that has to be digested. Not everything is digested. Of course has to be absorbed, goes through the circulation and then ends up in the muscle. Then we take like a minuscule amount of muscle and there we can measure how much of that initial thing and up.

[00:52:16] So that thing has made like this whole weird trip around the world. And then we're like. It's it's almost I don't know if you throw a handful of sand on a beach and then two weeks later, you're like, okay, Mike, can you count how many there is on this beach? Like it's so absurd how sensitive the technology is.

[00:52:36] **Dr Mike T Nelson:** And do you know about like for that a hundred gram per dose, like per subject, do you know about how much that cost is? Ooh I'm just curious. Cause it's gotta be expensive.

[00:52:48] **Dr Jorn Trommelen:** It's the, I think the, so it really depends on you can't say like label protein cost this much, but my guess is that this would be somewhere.

[00:53:05] My guess would be somewhere 50 to 200 in just in raw materials, like the trace amount, which is not that much, but you have to infuse a cow, which you have to buy like ethically, you need veterinary doctors, you have to infuse a cow for a lot of days. So you have to hire a barn. So everything combined, it's like a hundred thousands to do a study just to produce the labeled protein.

[00:53:31] So the raw ingredients are not that expensive, but it's so difficult because everything has to be approved for first for animal research, then for human and pharmacy costs. And so it's just it's 20 different types of costs together. But just alone a trait no I, so the amount of tracer we infuse during a study like this is about with inflation, probably like 300.

[00:54:00] So I would say. It's probably like 400, how much we put in the protein, but again, there's, that's just one of the costs because you're infusing this cow and it has to be supervised day and night because if the cow lays down and he closes his vein, then the tracer is just hours and you always need like an animal doctor.

[00:54:25] I don't know the proper word for it. So just the complexity is

[00:54:28] **Dr Mike T Nelson:** absurd. Yeah, I think that's the one thing that, because you read the study, and if you don't know the background it's a very short thing in the study, which makes sense, because you've got all, you've used everything, test, known to man, this thing, and people gloss over that, and then you see comments online of You dumb nuts, why didn't you test whey?

[00:54:45] It's you have no idea what you're even asking. And I think your lab did a study overnight in humans looking at, I think a 40 gram whey dose also. And if I correct my memory, I don't think you saw too much of a difference compared to the earlier casein work in the different studies.

[00:55:00] **Dr Jorn Trommelen:** Yeah. So it's interesting because some people are like, this guy doesn't believe in protein distribution.

[00:55:08] And I'm like, wait, before everyone thought I was like the protein distribution guy, because I did several studies on pre sleep protein. Yeah. Yeah. Yeah. So before it was, everyone's Ooh, you just have your agenda. So it's funny that now the other camp attacks me. But so yes, we did so like you mentioned earlier, or we did a bunch of studies with casein prior to sleep for the most part, just for practical reasons, AKA money.

[00:55:37] But we always got the question, does it have to be this slowly digestible casein or can it be way, for example? So there pre sleep, I would make the argument that. Maybe casein, or it's interesting. So the idea is it's a slowly digestible protein. So it's sustains amino acid release during the whole night because that concept that we discussed earlier, like usually you eat after four to six hours.

[00:56:04] After dinner, let's say six o'clock, it can easily be 10 hours or longer that you don't eat. So pre sleep protein makes sense. And even when you take something pre sleep a fast digestible protein might still not. Like it might provide a lot of amino acids in the first half of the night, but not the second half of the night.

[00:56:22] And then the hardcore bodybuilders are, and that's why I wake

[00:56:25] **Dr Mike T Nelson:** up. And yeah, I wake up at three in the morning. I did that for a while. It didn't help. I just got fat and my sleep was atrocious because I couldn't get back to sleep.

[00:56:34] **Dr Jorn Trommelen:** Ironically, like sleep is like one of the most anabolic things you can do. So as much as I love protein, I would recommend just sleeping and getting your protein in before.

[00:56:43] But we always got that question of. Does it have to be Cain? Because we know that works from the studies. So we decided to compare the Cain versus the way and both were effective. Let's start there. But the way seemed to be slightly more effective. It was not, there was no significant difference.

[00:57:05] But if you just look at the bar graph, so to speak, the way was slightly higher than the casein. Which is interesting because by now quite some studies have compared whey versus casein. But most of those studies have always used like that 20 gram dose often recommended early in the day. So for a long time, the hypothesis was like at least early in the day when you know your next meal is going to be in four or five hours, it makes more sense to get like a high amino acids.

[00:57:34] availability with a fast digestible protein. And it doesn't matter that it won't last that long because you're going to have your next meal anyway. So that's why they use like that 20 gram dose there, but pre sleep we used a bigger dose because again, the goal was to last the subjects during a longer overnight period.

[00:57:52] So that that's why we used 45 grams of protein, but even the way protein I believe it was still elevated. On top of my head. So after six hours, it was still slightly elevated above baseline and only literally when the subjects woke up, that's when it was completely back to baseline. So even with a fast digestible protein like way, that the more you eat, it will also take longer before it's fully digested and absorbed.

[00:58:22] But of course there, the casein. Wasn't fully digested and absorbed even after seven and a half hours of sleep. So it looked that the whey protein was slightly higher than casein, which is, if you look in the literature, a pretty consistent finding. Usually there's no difference or way is slightly higher.

[00:58:43] But here the situation is very different, longer measurement period and higher doses. So if there is a situation where a slow digestible protein would shine, this was it but still the way seemed a little bit higher now I've said seemed a little bit higher, like five times now, honestly, I think there.

[00:58:59] They would be exactly the same because as I mentioned, the case scene was still digesting. So I think the next hour, the case scene would have caught up to the way the count argument is there. Who cares? Because you're now awake and you have your next thing to think of the principle. But to make it short, in practice, both are two very high quality protein sources, and take whichever one is either cheapest or most feasible, or your preference, that is way more important than any minor difference between those two

[00:59:31] **Dr Mike T Nelson:** protein sources.

[00:59:33] Yeah. As we get close to the end, a couple more questions. Do you think you'll see now the, I haven't looked, someone probably already did this, the Mega anabolic protein program 4, 000 where it's three doses of 100 grams of protein in a day or Something right there just over extrapolating the research and going well if you could get you know, almost like it was I think 13 grams I think just showed it was potentially incorporated into the muscle tissue from a hundred gram dose you can do that three times a day then you'll you know triple your

[01:00:08] **Dr Jorn Trommelen:** Yeah, I have no clue what people will do.

[01:00:10] So the if you read the page I don't know if I regret it, but you could say that the title is it really sounds like I'm pushing more protein will. Result in more gains. That is, if you just read the

[01:00:25] **Dr Mike T Nelson:** title, and these are people who only read the title and barely read

[01:00:27] **Dr Jorn Trommelen:** the.

[01:00:29] Now I would counter that by saying I have by far the longest limitation section. Anyone has ever written in a paper. So if someone says like your title isn't over this, I'm like I think I'm more than balanced that with the longest limitation section ever. Moreover, if you read the paper. I know where I say this study means that you should eat this much per meal or in total in a day.

[01:00:53] I completely avoid saying how much protein should be measured. I treat this study as a, what's called a proof of concept study that if you eat more protein animals, animalism stays elevated for much longer. And that kind of takes away the main argument, the main data we had in support of protein distribution.

[01:01:14] So the message I'm. I'm throwing out there is if you absolutely want to do everything possible for muscle mass gains or just general recovery, there's really only upside for more protein. And there's really only upside to also trying to distribute it throughout the day. So by all means, I'm not saying to not do that.

[01:01:39] All I'm saying is probably protein distribution doesn't matter as much as we thought, at least if protein intake is high enough. So with one large meal, you can go for at least half of your day. Yes. This study showed that's really the only practical recommendation that Please don't spike your cortisol because you haven't had your next meal in four hours.

[01:02:05] That's the only thing I'm suggesting. I'm not suggesting eat a hundred grams of protein every this many hours.

[01:02:14] **Dr Mike T Nelson:** Yeah, it reminds me, even before this study came out, I was at ISSN we may have been at the bar there talking to Dr. David Church and Dr. Dan Moore and it was just fascinating because they were going back and forth about, does meal frequency with protein even matter, and their kind of conclusion at the end of it was maybe, but if you're getting all your protein in, like it's so far, distant down that if you're just getting enough protein in that was, they both agreed that's like by far and away, like the number one thing.

[01:02:46] And then you can start splitting hairs after that too. So I think that sometimes people miss the forest for the trees. And if you're, getting adequate amounts of protein, my interpretation of this study, correct me if I'm wrong is. You could maybe have a hundred grams in the morning.

[01:03:02] You could maybe have more later, but you're still getting a fair amount of protein during the day, and you're probably gonna be pretty good. You don't need to be super worried of, Oh, it's three and a half hours, and I need exactly 21.5 grams of fast acting whey protein, or all my muscle's gonna fall off.

[01:03:20] It's yeah, you're Body is much more robust than that. Yeah,

[01:03:24] **Dr Jorn Trommelen:** that's that's exactly the takeaway. And in practice, if I don't know, if you prepare an athlete for, let's say a bodybuilding show, I'm not going to come up with a meal plan with a hundred grams of protein at breakfast. Like it's possible, but it's not necessarily what should be recommended.

[01:03:40] Then people just. I don't know. At least some people are so offended Ooh, I ate this way. This study suggests this is also possible. They're saying what I'm doing is wrong. I'm just saying, no, it doesn't have to be that strict. Most likely. And who know, maybe you're lucky and this gave you a 4 percent advantage.

[01:03:58] Good for you. It's more a message for the people who don't want to have their timer every four hours to

[01:04:04] **Dr Mike T Nelson:** slam a shake. Yeah, that was my big takeaway I took is that it, I think it allows us much more flexibility to look at protein and, Hey, if you know you've got, so I'm thinking of like professionals and even some military people and, ER docs and people I work with, this gives me a little bit more research to say, yeah, if you're going to go do an eight hour surgery and it's, first thing and during the day and you only have time for one meal beforehand, Yeah let's bump up as much protein as we can in that meal.

[01:04:33] And you're probably going to be fine because what do you expect the surgeon to step out in the middle of the surgery to go get their protein? Like some professions and some things it's just unrealistic. So now we have some cool data to show that, yeah, you're probably fine. Just, get in more protein.

[01:04:48] You're probably going to be okay. Yep. Awesome. Very last question, like knowing all the work you've done on protein, especially with all the other studies and everything else you've done, for people listening, if they were only going to listen to like just the last couple of minutes, what would be your top four takeaways regarding protein?

[01:05:09] **Dr Jorn Trommelen:** The first one is if you just want to exist. You really don't need that much protein. So there's a lot of commentary on the recommended daily allowers and that it's way too little. No, it's fine. If your goal is to just not lose protein mass as a normal individual. So you really need little protein to just Yeah.

[01:05:32] Just stay upright. Exactly. Now, I think there's a lot of people, especially if they listening to this podcast to either optimize their health and, or their physical performance there, there is a reasonable amount of evidence that more protein is better. Probably most of your listeners are into fitness.

[01:05:50] They're generally, the recommendation that it's given is 1.6 gram per kilogram per day. Based on the meta analysis that you could also have some

criticism, but it is a pretty good estimate. So it's essentially double the RDA. If you do that, you probably have at least 90 percent of all the protein details.

[01:06:12] covered, because again, the more protein you eat in general, the less protein distribution matters. But also the more protein you eat, the less protein quality. We haven't touched on it that much, a little bit in the whey versus casein discussion, but ultimately what does protein do? It gives different amino acids to your body that's are used as building blocks.

[01:06:36] Even if your protein is slightly less efficient. So for example, plant protein, as long as you eat enough, like it's the sum of amount times quality, you still end up with enough. So even vegans, maybe they need a little bit more. So my main tip is number one, if you just want to exist, 0.8 gram per kilogram per day is more than enough.

[01:06:58] If you're an athlete who wants to do like the minimal amount of efforts just try to eat a little bit more protein and with 1.6 gram per kilogram per day, you should have 90 percent of your goals or your maximum gains covered. Maybe if you're a vegan, go a little bit higher just to play it safe.

[01:07:19] That's about it. If you're a competitive bodybuilder, I would still optimize protein distribution, maybe just from a society and practical point of view. But no one really has to worry about it if they eat

[01:07:30] **Dr Mike T Nelson:** enough.

[01:07:34] I think the big takeaway is making sure you get enough protein, higher amounts, probably better. And if you do that, you're going to be pretty good most of the time.

[01:07:43] **Dr Jorn Trommelen:** I'm joking in the lab that after this study, we're done. We're getting no more funding. We failed at all. I would just eat more protein.

[01:07:51] Everything else is details.

[01:07:55] **Dr Mike T Nelson:** Awesome. And where can people find more about you? I don't know if you have any public facing stuff now, or you're going to crawl back into the lab and do another cool study and we'll see in four years again, or?

[01:08:07] **Dr Jorn Trommelen:** I was also joking in the lab, like literally I don't know if I'll be ever as motivated to do studies again, but you only get more and more crazy ideas, but I'm trying to balance I trying to balance it again, because at the end of the day Me reading studies from a specialist to Philip's lab back then, that's what got me into science.

[01:08:25] It's my turn to hopefully inspire one or two. new people who come up with smarter stuff than me. So people can follow me on most social media as nutrition tactics used to be very active, slightly less active in the last couple of years, because this study sucked up every waking moment.

[01:08:47] But This is the first podcast in a while and I'm not stopping. So I hope to see people at

[01:08:53] **Dr Mike T Nelson:** the nutrition tactics. Yeah. And you've got a lot of great stuff that's actual it's nice because it's research based, but to me, it's also very practical. Like you do a good job of saying, okay, here's what the research show.

[01:09:05] And here's the pros of it. Here's the cons. And here's the actual shocker, like context of why this, study matters where I think a lot of times the context and the details just get. Thrown out and it's just a weird headline that may or may not be true. So I appreciate all the great stuff and.

[01:09:22] Thank you so much for doing the study and all the work that went into it, especially congratulations on the publication in Cell, which is a huge top tier journal. And it's so easy for me just to sit on my couch and read something like this and have a little bit of an idea of holy crap, this is a piss ton of work that went into this and I just get to sit here and drink coffee and read it.

[01:09:41] So that's great.

[01:09:43] **Dr Jorn Trommelen:** Thanks so much for the kind words and let's see if we can do another one within four years

[01:09:48] **Dr Mike T Nelson:** this time. Yeah. Sounds good. Thank you so much. Really appreciate it. I see you, Mike.

[01:09:55] Thank you so much for listening to the podcast here. Huge thanks to Dr. Jorn Trommelen for being on the podcast. Really appreciate it. A huge thanks to him for in his lab there with Dr. Luke Van Loon and everyone on that study for all the work that went into it.

[01:10:09] It was a massive study that they measured a ton of stuff in humans using tracers, looking at protein, which is something all of us are very interested in for adding. More muscle and improving body composition. So huge thanks to him and for giving up his time to chat with us here. Really appreciate it.

[01:10:30] If you want to learn his top four takeaways regarding protein, go to miketnelson.com/flex4 that's miketnelson.com/flex4, and you will be able to get those. And then also we've got the flex diet metabolism summit coming up February 9th through the 11th.

[01:10:52] Make sure to sign up for that. You can get free access to 30 plus talks that I have custom picked all of the speakers there. It's going to be a lot of fun, and it's free. You just have to sign up with your newsletter, or I should say you'll be on the newsletter. But you'll get free access to all of the talks for the weekend of February 9th through the 11th, 2024.

[01:11:12] Go to flexdietsummit.com And if you want something very tasty for electrolytes check out LMNT. Go to drinklmnt.com/mikenelson. Thank you so much for listening to the podcast. I really appreciate it. If you enjoyed this episode with Jorn, please share it around and tag me on the socials so I can say thank you.

[01:11:37] Any stars you feel is appropriate helps. Even a very short review in the old iTunes helps us a ton to move up in the rankings. Thank you so much. Really appreciate it. Talk to all of you next week.

[01:11:51] What do you suppose they call that? A novelty act? I don't know, but it wasn't too bad. Well, that's a novelty.

[01:12:01] **Nancy:** This podcast is for informational purposes only. The podcast is not intended as a substitute for professional medical advice, diagnosis, or treatment. You should not use the information on the podcast for diagnosing or treating a health problem or disease or prescribing any medication or other treatment.

[01:12:17] 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.

[01:12:33] 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. Information and statements regarding dietary supplements are not intended to diagnose, treat, cure, or prevent any disease.

[01:12:50] 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. Individuals on this podcast may have a direct or indirect financial interest in products or services referred to therein.

[01:13:08] If you think you have a medical problem, consult a licensed physician.