



Episode 38 Transcript

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Straight talk on Protein and more with Dr. Jose Antonio

Nick Collias: Hey, everyone. Welcome to a most nutritious episode of *The Bodybuilding.com Podcast*. I'm Nick Collias, she's Heather Eastman, and we're happy to have you listening, as always. And we're happy to have Dr. Jose Antonio visiting us, as well, from far away Florida, coming all the way to Idaho, the first time, I'm assuming?

Jose Antonio, Ph.D.: This is my first time in the beautiful city of Boise, although it's kind of gray. I'm used to sunshine, palm trees, beaches, dolphins.

Nick: This is the way it should be. The sun is the enemy.

Heather Eastman: You're in the northwest now.

Nick: Dr. Antonio is the CEO and co-founder of the International Society of Sports Nutrition, also professor at [Nova Southeastern University](http://NovaSoutheasternUniversity.com) in Florida, yes?

Jose Antonio, Ph.D.: That is correct.

Nick: Author of a wide variety of research papers on nutrition, supplementation, and one of the loudest voices out there speaking in defense of protein and a high-protein diet.

Heather: Yeah.

Jose Antonio, Ph.D.: Am I that loud?

Nick: Loud. I thought you had a shirt on that says "Defenders of Protein."

Jose Antonio, Ph.D.: It says P.

Nick: Just P?

Heather: Just P.

Nick: Got the P shirt on. People who read Bodybuilding.com regularly, they love their macros, we hear in the comments, right? This is a macro-conscious group, generally. When you talk about a high-protein diet, what are you talking about ... a high-protein diet?

Jose Antonio, Ph.D.: That's a good question. I love the fact that people obsess over macros, and particularly protein. Now, what's interesting about protein is, as you well know, you've probably interviewed 5,000 people, 10,000.

Nick: Easily.

Jose Antonio, Ph.D.: The RDA for protein is what, Heather?

Heather: .8 grams per ...

Jose Antonio, Ph.D.: Wow. She gets an A plus. I like that.

Nick: I was gonna say that.

Jose Antonio, Ph.D.: 0.8 grams per kilo per day, right? Which is enough, I would say, to feed my hamster.

Nick: What is that per pound?

Heather: A kilo is-

Nick: That's-

Heather: ... 2.2 pounds?

Nick: Right.

Jose Antonio, Ph.D.: Very good. She paid attention in science class. I like that. 0.8 grams per kilo is the recommended dietary allowance or daily allowance. We've actually known for probably four or five decades that the RDA is way too low. And, in fact, what's interesting is, clinicians seem to stick to this RDA and maybe even a little bit above it. But what's interesting is, if you watch athletes and what they do and how they train and how they eat, they all eat well above the RDA. And really, the sticking point was this: What happens to your body if you eat well above the RDA? Does it have any health consequences? Is it harmful? Is it bad for your kidneys? And so people have argued about, "Well, when does high-protein intake become high?" And I've always defined it as, you gotta hit at least 1 gram per pound or 2.2 grams per kilo, and once you get above that, then we'll define it as

high. But really, to me, the baseline intake for all athletes should be about 1 gram per pound or 2.2 grams per kilo. Anything below that, I define as moderate intake.

And that applies, actually, not just to bodybuilders and strength/power athletes, but it also applies to endurance athletes. Of course, if you don't work out, then none of this applies.

Nick: Now, somebody who maybe doesn't really like counting or calculating their macros, doesn't really like bothering with calories, if they were just going to bother with one thing and say, "All right. You know what? I'm only going to ... I'm going to focus on eating one gram per pound of body weight, or 20 grams every meal, or whatever it is, and just let the rest of my diet fall where it may. Let the chips fall where they may," what could they do with just that approach?

Jose Antonio, Ph.D.: Well, actually, one of the things I tell my students is that nutrition shouldn't be about mathematics. I mean, you shouldn't have to count carbs, fat, this-

Nick: Right.

Jose Antonio, Ph.D.: ... and that, and what's the percent of ... am I hitting a 40, 30, 30? To be honest, I think it's all a waste of time. Because ultimately, even for high-end athletes, if you focus on the one number, and that one number is how many grams of protein do you get per day, if you weigh 200 pounds, aim for 200. If you hit 250, great. If you hit 150, that's not so great, maybe you should bump it up the next day. And when you hit your protein needs per day, what you should do is end up back-filling carbs and fat. And typically what happens is this: Let's say I work with endurance athletes. I say, "Okay, you weigh 150 pounds, you're a triathlete, I want you to get at least 150 grams of protein, try to spread it out throughout the day, make sure you get some protein after you work out. Backfill the rest of your diet with carbs and fat." And typically, with endurance athletes, they eat so much volume of food that it's not a problem getting the carbs and fat. Bodybuilders are kind of a tricky ... well, not tricky.

Heather: We're special.

Jose Antonio, Ph.D.: They're odd in the sense that ... in fact, if you ask some bodybuilders, they say, "Well, we're not doing a sport. This isn't a sport. We just are up there in our underwear"-

Nick: It's a lifestyle.

Jose Antonio, Ph.D.: Exactly, it's a lifestyle where you pose in your underwear. For them, it's tricky because they're not really performing a sport. I always ask people, "What's your goal? Are you trying to run faster? You trying to lift more weights?" But if the goal is to look prettier, it's much harder to define the endpoint, because what the hell's looking prettier? Well, usually it's you gain muscle, you lose fat. Well, how do you gain muscle, lose fat? Well, to gain muscle, lift weights. To lose fat, eat better. And for bodybuilding, because you're not performing a task and you're not being judged on a task, typically the way they eat is not the way a performance athlete would eat.

Nick: Right.

Jose Antonio, Ph.D.: For instance, if you're a linebacker in the NFL, these guys weigh 250, 260 pounds. They're actually built like bodybuilders, but they gotta move fast. The way they eat should be different than the guy standing onstage who's ripped at 250 pounds. Bodybuilding nutrition, or

what I call physique nutrition, is much different than what I like. I actually prefer sports nutrition, because you're training for a goal that's measurable.

Nick: Right.

Jose Antonio, Ph.D.: And unfortunately, bodybuilding's not really measurable. It's ...

Nick: Sure.

Jose Antonio, Ph.D.: ... I like the guy with the big pecs, or I like the girl with the big butt, or whatever.

Heather: Yes.

Nick: Now, that bodybuilder who may be listening to this, they probably heard that standard of one gram per pound of body weight, and they go, "That's really low."

Jose Antonio, Ph.D.: Yeah.

Heather: Right.

Nick: That's very low compared to some of the recommendations that have been in programs on our site over the years. What happens between one gram and two grams or 2-1/2 grams?

Jose Antonio, Ph.D.: That's a damn good ... oh, I ... can I say that?

Nick: Yes.

Heather: Hell, yeah. You can say whatever ...

Nick: Say whatever the hell you want.

Jose Antonio, Ph.D.: That's a damn good question. Here's why, because there's only one human being on the planet who's done research looking at super-high-protein diets. You know who that is? Me.

Nick: I thought so.

Jose Antonio, Ph.D.: Ah, see.

Heather: And we're talking to him.

Jose Antonio, Ph.D.: Now.

Nick: Felt like a trick question ...

Jose Antonio, Ph.D.: In fact, in fact one gram per pound is the baseline. That's the minimal amount you should do. Now, I remember ... this was four or five years ago, I had a conversation with one of my students, who happened to be a recreational bodybuilder. And just for shits and giggles ... I can

say that too, can't I?

Nick: Mm-hmm (affirmative).

Jose Antonio, Ph.D.: Yeah. I said, "Hey, you seem to eat a lot. How much do you eat?" And he went through the Rolodex in his head, and he's like, "Da, da, da, da, let me calculate. Oh, I eat about 300 grams of protein." And I got my calculator out. I'm like, "You're getting almost three grams per kilo. Wow, that's ... that's a lot."

Nick: Right.

Jose Antonio, Ph.D.: And it prompted an idea in my head. I said, "How come no one's ever done a study where you just get guys and girls who lift weights to eat a lot of protein?" It seemed simple, and I realize why no one did it. We embarked on the first study, where we had guys and girls who lifted weights consume two grams per pound. That's 4.4 grams per kilo, which is a lot of eating.

Nick: How much of that was shakes?

Jose Antonio, Ph.D.: It's almost all shakes.

Heather: I was gonna say, 'cause you wrote an article for us where you recommended trying to get as much protein as you could from whole food.

Jose Antonio, Ph.D.: Oh, I still recommend that. But there's a point where, once you eat enough whole food, you just don't want to eat.

Nick: Just guzzling shakes.

Jose Antonio, Ph.D.: And what's interesting ... so we did, and I'll get to that, we did the ... it was two grams per pound or 4.4 grams per kilo. We did it for two months, or eight weeks, and we didn't change their training. We were like, "Okay, don't change your training. The goal is just to get a lot of protein." And they had to do it through shakes, 'cause it is ... I don't want to say it's impossible to do with food, but unless you sit at home and don't have a job and you eat chicken all day-

Nick: Right.

Jose Antonio, Ph.D.: ... it ain't happening.

Nick: Set the alarm for 2:00 a.m.-

Jose Antonio, Ph.D.: Exactly.

Nick: ... and drink it. That's the only...

Jose Antonio, Ph.D.: You literally have to be a professional eater, which is nuts. All these guys were like ... in fact, they all said they had to figure out how to put themselves on an eating schedule, meaning take a shake, just to hit the 4.4 grams per kilo. And what happened after eight weeks, when we tallied the data, I think we finished with 50 subjects, we found something interesting. The group that ate a lot of protein, they didn't gain any weight, they didn't gain any muscle, they didn't gain any

fat. Nothing happened, which is really interesting, and we can get into mechanisms if you want, get in that science stuff. But people were like, "Well, how can you eat that much protein and not get fat?" Well, there are things that happen to your body when you consume protein, but the key thing we found is that the upper limit, it seems, for protein intake needed for, let's say, gaining lean body mass might be between two and 2.5 grams per kilo, which is a little over one gram per pound.

Now, is it a waste to do more than that? The answer to that is no, because you still utilize it, but it may not be utilized for building muscle. It's utilized for other things. We are actually following up with a one-year study in trained women to see what happens when they consume about 2.8 to 2.9 grams per kilo per day, actually looking at their bones, 'cause one of the silly things clinicians always say is, "Oh, you eat a lot of protein, it's bad for your bones."

Nick: Right.

Jose Antonio, Ph.D.: "It demineralizes." It's just a crock of shit, but they say it all the time, and I'm like, "Why would protein demineralize your bones?" And we actually are halfway through the study. We have six months of data. I actually presented it at a conference last week in Florida, and nothing. Female athletes can eat a lot of protein, and your bones are fine. It's absolutely fine.

Nick: Should protein just be considered free calories?

Jose Antonio, Ph.D.: Ugh, should protein be free calories? Well, put it this way. It's very difficult to get fat if the only thing you overfeed on is protein. And I think ... at least, that's what our data says, and other data, maybe not on such well-trained athletes, suggests the same thing. But I think what's interesting about protein is that we all know about the thermic effect of feeding or food, your audience is quite well aware of that, but there's also another thing that it might affect. It's call NEAT, non-exercise-activity thermogenesis. So, if you eat a lot of protein, maybe it causes you, for whatever reason, to just move. And we're not talking formal exercise, we're just talking movement. Non-exercise-activity thermogenesis could be fidgeting. It could be walking instead of standing. It could be taking the stairs instead of the elevator or escalator.

Nick: Be going like this because you have protein farts?

Jose Antonio, Ph.D.: It could be that. Hey, anytime you're moving its non-exercise-activity thermogenesis. Put this way: Moving is always better than not moving, and it doesn't have to be formal exercise.

Heather: Interesting.

Nick: When people say protein, you think whey protein or you think a powdered form of protein. Would that same thing apply to somebody who's just taking in vegetable-based protein? I'm a big fan of a veggie protein shake, I have to say. It feels more like food. There's actual fiber and nutrients and all those other things. Lot of them match up fairly well amino acid profile wise these days. Is it every bit as good when you think of it that way?

Jose Antonio, Ph.D.: Ok, vegetarian protein ... we actually had one of our subjects was a vegetarian bodybuilder. He had to do six to eight shakes a day just to get his protein intake.

Heather: Just to get the protein.

Jose Antonio, Ph.D.: I mean, I don't know how you do that.

Nick: Right. Ooh, that's a lot of shakes.

Jose Antonio, Ph.D.: Even if you could do the whey and the casein, that's just a lot of shakes. Is it doable? Yeah, it's absolutely doable. However, when you do head-to-head studies of milk-based proteins particularly compared to vegetarian-based proteins, milk-based proteins always do better. However, you can make up for the lack of quality in vegetarian proteins by increasing volume. Put it this way, if you drink enough of it, it doesn't matter. You're getting plenty. But, I know I worked with a lot of smaller women, endurance athletes, who ... their intake of food may not be quite adequate. The quality of protein they take in becomes critically important. But when you're dealing with guys who eat volumes of food, it probably doesn't matter 'cause they're getting so much protein.

Nick: Ok... Go ahead.

Heather: Well, I was gonna say ... I'm interested 'cause a lot of these newer bodybuilders, they're really studying the science behind their macros. They get what protein does, and really ... in your studies, did you take a look at how the other two macronutrients really interact with proteins, if you're having protein in a high-fat meal or if you're having protein in a high-carb meal? 'Cause I hear a lot about people trying to really dial in the science. And that's what makes bodybuilding an art and a science in some ways, that people are ... they're trying to really nail down this elusive ...

Nick: The *meal* is such a thing.

Heather: Thing, you know?

Jose Antonio, Ph.D.: And actually, what you asked would make for a very complicated scientific study, and that's why no one studies it. Really, the studies I did were quite simple. Don't change your diet. We're just gonna throw a ton of protein on top.

Heather: A ton of protein.

Jose Antonio, Ph.D.: When you start manipulating carbs, fat and protein, now you're getting into an area where compliance becomes a huge issue in these studies. In fact, that's why you rarely see studies on the ketogenic diet. Why? 'Cause compliance is hard as hell. I mean, who wants to eat 70 percent fat? So all of these diet studies, I commend any scientist who wants to do this, because I wouldn't do it. I mean, I call my studies high-protein-diet studies, but in fact, they're really high-protein-supplementation studies. Now, when you're looking at ratios of carbs, fat and protein ... again, for bodybuilding because, as you mentioned, it's really more of an art than a science ... a lot of things will work for reducing body fat. To me, gaining muscle is more a function of training plus diet, whereas losing body fat is probably more a function of diet alone. That probably plays a more critical role.

And I'll tell you this: If you take, let's see, a low-fat, high-carb diet or a high-fat, low-carb diet and you make the protein intake identical, the fat loss will be identical. Protein is the key driver of fat loss. It's not, "Well, I dropped my carbs," or, "I dropped my fat." It doesn't matter if you drop your fat or carbs. It's protein that's the driver.

Heather: You don't often see the low-protein diet.

Jose Antonio, Ph.D.: So... Exactly! You're right. Well, actually-

Nick: There are low-protein diets.

Jose Antonio, Ph.D.: Not on purpose. The ketogenic diet is somewhat low on protein.

Heather: It is low on protein, yes.

Jose Antonio, Ph.D.: That's why it sucks.

Heather: You have to be, because it's-

Nick: They call it moderate protein.

Heather: Moderate protein.

Nick: I watched an intermittent fasting documentary where a guy was committed to a low-protein diet and he was just eating this giant bowl of raspberries, and it was taking him all day to eat this giant bowl of raspberries.

Jose Antonio, Ph.D.: That's nuts.

Heather: And you touched upon, and you ... you said, debunked the whole, "It's bad for your kidneys. It's bad for your bones." Without going too deep into the science, can you just give us a little overview of why, because we hear that a lot. "Oh, it's bad for your kidneys. Oh, it's, you know, it's gonna leach the calcium out of your bones."

Jose Antonio, Ph.D.: Well, the bad for your kidneys. I heard that back in grad school when ... God, who was President? Ronald Reagan. You remember Ronald Reagan was President?

Nick: I remember that guy.

Jose Antonio, Ph.D.: Back in grad-

Nick: Grade school for me.

Jose Antonio, Ph.D.: But I remember my professor saying, "If you eat too much protein it's bad for your kidneys." It's even in textbooks, actually. In fact, it's still in textbooks, which is kind of annoying. But the idea is this: When you consume protein, it has to be broken down. The waste product is urea, which contains ammonia. You gotta pee it out, right? It has to exit your body through your kidneys. And the idea was, "Well, you must be overworking your kidneys because you're eating all this protein, you gotta get rid of the urea," and the idea that "Well, your kidneys can't handle the load. It must damage your kidneys." Well, that makes about as much sense as, "Well, you shouldn't do any cardio 'cause it stresses the heart, and you know what happens, the heart has to pump more, it has to ... more beats." Same silly stuff. Physicians back in the sixties and seventies were saying, "Yeah, don't exercise so much. It's bad for your heart."

Why? 'Cause exercise is a stress on your heart. But guess what, boys and girls? Anything you do to your body, your body adapts to it. If you exercise more, your heart gets stronger. If you lift more weights, your muscles get bigger. If you eat more protein, your kidneys do a great job eliminating urea. It's what your body does. It's like saying, "Hey, I live in south Florida. I sweat all the time. Hey, my sweat glands are working hard. Maybe it's bad for my sweat glands." I mean, that's the kind of silly reasoning you see. And these are not ... I mean, these are educated ... I was about to say, "These are smart people." Well, I remember my-

Nick: Educated.

Heather: Educated. They're educated.

Jose Antonio, Ph.D.: No, but my father used to say, "Just 'cause they're educated doesn't mean they're smart."

Nick: Right.

Jose Antonio, Ph.D.: You got a lot of educated dumb people who are saying that your kidneys are overworked because you gotta get rid of this waste product. Well, guess what? You're drinking coffee, right?

Heather: Tea.

Jose Antonio, Ph.D.: Oh, tea. Well, the act of drinking fluid will make your kidneys work harder, 'cause guess what? You gotta go to the bathroom. Well, that's gotta be bad for your kidneys, right? So it's this bizarre reasoning that I see amongst mainly clinicians that ... it just annoys the hell out of me, 'cause I've heard it for three decades now, and it's just bizarre.

Nick: But there's a certain appeal to it beyond just the, "Oh, you know, I'm trying to look out for your interests."

Heather: I was gonna say...

Nick: There's something about the high-protein diet that people just ... they associate with something.

Heather: Anyone who's been in the gym and smelled that ammonia smell of that guy that's had a little too much protein.

Nick: Well, that's not what I was saying. What's the resistance? What's the resistance to protein, though?

Jose Antonio, Ph.D.: Well, that's different. They just stink. But no, it is interesting. There's this weird anti-protein sentiment that you see ... in fact, you go on social media and, not that I'm surprised anymore, but I'll see so-called experts, people who are trained in nutrition, blah-blah-ing about the harm of protein, and including the bone demineralization thing. And what's even more annoying about that is, guess what? We can actually measure bone. Why don't we just get people, guys and girls who eat a lot of protein, measure their bone mineral density. It's fine. And in the six months of data we've collected so far at my university in south Florida, Nova Southeastern University, these

girls, they're ... one of my girls, she's a physique athlete, she went up to 4.8 grams per kilo. I had an endurance athlete go up to about 3.1 grams per kilo. Nothing happened to their bones. If anything, there's data suggest that increasing protein intake increases the bone mineral density of the lumbar spine. That's lower back.

If anything ... there's two things that could happen: One, nothing will happen. Or two, it might slightly elevate bone mineral density. It's just weird. I've run into this anti-protein sentiment, and I'll even make it broader. There's an anti-supplement sentiment typically that you see with clinical nutritionists, and I think part of it is, they're not familiar with athletics. They don't know what athletes do. And two, I think there's just an inherent bias in the way they're trained in clinical nutrition, which is much different than sports nutrition.

Nick: Sure.

Jose Antonio, Ph.D.: And it's just bizarre. I mean, for myself and my friends, and you'll meet a lot of my friends when they come in here, we laugh about it. It's like, "Hey, that's really funny." But people take that stuff seriously.

Nick: Right. Right. I wonder sometimes if it's just that the word protein is just forever associated with professional wrestlers in people's minds like-

Heather: Right.

Nick: ... if I prioritize protein, it means, therefore, I am becoming a bodybuilder, the ultimate crime.

Jose Antonio, Ph.D.: No, actually that's probably pretty close to the truth, because it's true. Protein and supplements is almost always associated first with bodybuilding and then maybe other athletes who do stuff.

Nick: Right.

Jose Antonio, Ph.D.: But it's always bodybuilding first. What's wrong with bodybuilders?

Nick: Right.

Jose Antonio, Ph.D.: They just want to look pretty.

Nick: Right. And we've had some people come on-

Heather: There's nothing wrong with that.

Nick: ... or just ... we've run some articles recently that basically said, "As you get above age 35, or 30, or whatever, you need to be an unapologetic bodybuilder," basically. You can resist it your whole life, but get to this point and muscle and protein have to be your priorities.

Heather: Actually, in that article I referenced earlier, you talked about elderly men and women are the age group that needs to eat higher protein.

Jose Antonio, Ph.D.: Yes, because data is showing that elderly men and women actually become

less sensitive to protein. Their intakes actually have to go up.

Heather: Interesting. Very interesting. Whenever we talk about recommended daily allowance, I always try to recommend to people that it's the minimum line. It's get at least this much. 'Cause you hear people say, "Well, I'm not lifting weights. I'm not running marathons. I don't need to eat more than this. You know, I'm fine." You do argue that there is a case for the average Joe that's sitting there watching football?

Jose Antonio, Ph.D.: And, in fact, there was a study that just came out where they got ... these are 60 to 80-year-old men and women, and they were all ... they split them up into the RDA group, 0.8 grams per kilo, and twice the RDA, which to me is still not that high. It's 1.6 grams per kilo. And just the mere fact of increasing protein intake in 60 to 80 year old women, it elevated their lean body mass. But here's the argument I hear ... well, it's not even an argument. It's people shoot from the hip, and they're like, "Well, okay, so they gained some lean body mass. So what? I mean, they're 60 to 80 years old." Well, one of the things ... if you ever end up in a hospital ... put it this way. Don't end up in hospital laying in bed-

Nick: I'll do my best.

Jose Antonio, Ph.D.: ... because you're gonna waste away like whatever.

Nick: Right.

Jose Antonio, Ph.D.: If you lose lean body mass while laying in a hospital bed, that is one of the predictors of mortality and morbidity. You will ... you don't want to lose lean body mass. The mere act of keeping lean body mass on with age ... and you don't have to be "a bodybuilder" per se, you just have to move your body ... is a good thing. And protein helps.

Nick: Moving your body, you're getting back to NEAT. I wanted to circle back around a little bit to that, because you implied there's some connection between non-exercise-activity thermogenesis and protein. I didn't quite understand what the connection was there.

Jose Antonio, Ph.D.: That's because a lot of us don't understand it. We're all in the same boat. Now, here's what's interesting: Obesity researchers, instead of focusing on ... well, let me backtrack. If all you do is change your exercise habits alone, it's very difficult to lose weight. If you change exercise and diet, it becomes more easy to lose weight. But the exercise part is maybe the part that we should not be focusing on, particularly with the overweight. It might be the non-exercise activity part. Because let's face it, most of us work out 30 to 90 minutes maybe. It depends what you do. But what about the rest of the day? Unless you have an office job where you sit on your desk and type all day, maybe you should stand up and move. Maybe you should walk. Maybe it's okay to fidget. Any movement is good. And what's interesting is, they've done studies comparing non-exercise-activity ... exactly, you gotta scratch ... non-exercise-activity thermogenesis, and there could be as much of a difference as 2000 calories.

That means there's some people who literally just sit still all day and other people who you're like, "Gah, will you sit still?" But those are the people that are gonna not be fat as they get older. Imagine that. A 2000-calorie difference per day. What is that equal to? That's equal to running 20 miles. Who the hell runs 20 miles? Well, marathoners and other than that, nobody. The non-exercise-activity thermogenesis could play a big role. And let's say it's not 2000. Maybe just by moving you burn an

extra three to four hundred calories every day. That's still equal to running three or four miles.

Nick: Then, maybe those people just also happen to take in more protein because they have the extra need from all that activity?

Jose Antonio, Ph.D.: No, it seemed ... I think the idea is that protein itself may predispose you to moving more. And let me tell you, I didn't mention ... a couple of the weird ... not weird, the expected side effects from these high-protein diets. I remember this one particular female subject, a tiny girl, she said, "God, I'm just hot all the time, like temperature-wise." She says, "I'm sweating at night. I have to lay in bed and just turn the fan on 'cause literally," she says, "I like sweat before I fall asleep." She was eating ... I mean, 'cause she was on a high-protein diet. And that was an extreme. I mean, everyone said they felt hot, but this particular person, I was like, "Wow."

Nick: Literally steaming?

Jose Antonio, Ph.D.: Literally. She's like, "I'm just sweating all day." And that's why it's just so hard for you to get fat eating protein, because your body just has to burn through it. And also, the ... the other odd side effect with protein is that it doesn't ... people like, "Well, that's a lot of extra calories." Well, it's not like it's stimulating your appetite so that, "Now I want a doughnut," or, "Now I want fried chicken," or something. I think in the long run it might end up blunting your appetite a bit. You end up not eating or craving junk. I think that's what happens with a lot of people.

Nick: Interesting. I find that when I have a shake after a workout it only makes me hungrier.

Jose Antonio, Ph.D.: Really?

Heather: Could be the sugar in the shake.

Nick: That could just be that I'm really hungry, I don't know.

Heather: I find that when you're actually chewing protein ... 'cause as a bodybuilder you're eating a-

Jose Antonio, Ph.D.: Right.

Heather: ... lot of chicken and a lot of stuff that has to be chewed.

Jose Antonio, Ph.D.: That makes you tired.

Heather: You get to a point where you just don't want to eat anymore, and-

Jose Antonio, Ph.D.: Is this after cardio or weight training?

Heather: Both.

Nick: Both.

Jose Antonio, Ph.D.: Oh, it doesn't matter.

Nick: I'm just generally a hungry individual.

Heather: Bodybuilders eat all the time. Well, one of the-

Nick: He's sitting over there thinking, "I think he has cancer. I think he has a tumor."

Heather: One of the questions we get asked a lot are, "What are some of the best food sources of protein?" And since we have you here and you are-

Nick: And the answer is clearly eggs.

Jose Antonio, Ph.D.: I love eggs. No, eggs are great.

Nick: She sells me eggs.

Jose Antonio, Ph.D.: Oh.

Heather: I've got lots of chickens at home.

Nick: She's got the eggs.

Jose Antonio, Ph.D.: You grow chickens?

Heather: I do.

Jose Antonio, Ph.D.: She sells you the eggs and then she kills the chickens and sells you chicken. No.

Nick: She's a murderer.

Jose Antonio, Ph.D.: Actually, the animal-based proteins are the best. In fact, if I were to pick a single source I always say you can't beat fish because you also get a lot of the healthy fat with it. It's a great source of protein and great source of fat. But protein alone, eggs and the milk-based proteins seem to do the best. If you're looking at muscle protein synthesis, which is ... let's face it, that's what most of your audience cares about-

Nick: Right.

Jose Antonio, Ph.D.: ... it would be eggs and milk, or the milk-based protein. That would be whey protein, casein protein, things like that. After that, it would be beef, chicken and pork. The vegetarian-based proteins, I would say, would fall after the animal-based proteins but, again, you could make up for the lack ... I don't want to say lack of quality. It's more like the lower levels of some of the essential amino acids like leucine, you could just make up for it by increasing the volume you consume. If your post-workup shake is 20 grams away, you could probably do 25 to 30 grams of soy or rice protein or pea protein, something like that. But eggs and milk are great.

Heather: 'Cause that's another question we get, is-

Nick: Lacto-ovo.

Heather: ... "I'm a vegetarian, what do I eat?" And so you're saying eggs and milk are way up there, so even if you're a vegetarian and you don't eat meat, if you eat eggs and milk you can still be okay?

Jose Antonio, Ph.D.: Wait, if you're vegetarian, can you have eggs?

Nick: You can be a lacto-ovo vegetarian.

Jose Antonio, Ph.D.: That's like a-

Heather: Traditional vegetarian is-

Jose Antonio, Ph.D.: That's like a quasi-vegetarian.

Heather: Correct. What we think of as a vegan is a real vegetarian-

Jose Antonio, Ph.D.: Ah.

Heather: ... and then, vegetarians are usually ovo-lacto vegetarians.

Jose Antonio, Ph.D.: Ah.

Nick: They get to have cheese, which makes them happier.

Heather: Some of them cheat. They're ovo-lacto pescatarians. They eat fish, too.

Jose Antonio, Ph.D.: Oh.

Heather: I know.

Jose Antonio, Ph.D.: Now, that's real cheating.

Heather: I know.

Nick: Fish don't have souls. That's the difference.

Jose Antonio, Ph.D.: Or feet? Is that ... it's the feet part?

Nick: They have a foot thing, those vegetarians.

Heather: "There's no feet, it's okay to eat."

Jose Antonio, Ph.D.: It's interesting when I say, you know what? Fish, that's still skeletal muscle, 'cause all you're eating is skeletal muscle. Like, "Well, doesn't have a hoof."

Jose Antonio, Ph.D.: Chickens don't have hooves. Just odd.

Heather: Doesn't have a cute face.

Jose Antonio, Ph.D.: That's true.

Nick: One other thing that I kept on seeing associated with you online is the Antonio adage, which is, "If it helps or has a neutral effect, try it."

Jose Antonio, Ph.D.: Just frickin' do it.

Nick: Right. And I want to help people figure out how to put this into action, because everybody fancies themselves an expert right now. And we've added so many references to so many articles, because people want to see them. Everybody wants to go click and look at their little abstract or read the whole damn study and figure out themselves how to put it into action in their life.

Jose Antonio, Ph.D.: Right.

Nick: How do you put that into action, that adage?

Jose Antonio, Ph.D.: Well, what's interesting is, if you go outside of these supplements that have the most research: protein, creatine, caffeine, beta-alanine, there's this laundry list of supplements where hmmm, there's not a lot of data, but there is data. For instance, branched-chain amino acids, citrulline, taurine-

Jose Antonio, Ph.D.: There's all sorts of them. People say, "Well, should I take it?" And I always say, "Well, the adage is, 'If it helps or has a neutral effect, try it.'" Or the other one, which is ... I'll make an allusion to a book I was just reading. I don't know if you guys are fans of the Jack Reacher series, but-

Nick: I've read a couple of those, sure.

Jose Antonio, Ph.D.: I love Lee Child's Jack Reacher series. I was reading his latest book, and there was a great saying in it. It was ... and I was thinking, "Wow, this applies to supplements." "It works more than never, but less than always." And that really applies to a lot of supplements. More than never, less than always. Branched-chain amino acids. I remember getting in a discussion with a friend of mine. They're like, "Well, of course, branched chains suck, because why don't you just have whey protein, 'cause whey stimulates muscle protein synthesis better than branched chains?" I'm like, "You're absolutely right, it does. However, they're not mutually exclusive propositions." Can branched-chain amino acids stimulate MPS or muscle protein synthesis? Yeah, but not as much. Again, it's more than never but less than always. Also, branched-chain amino acids have a role in lowering delayed-onset muscle soreness. And, believe it or not, 99.9 percent of athletes who do a performance sport don't want to be sore. That's a reason to take branched chains.

You know what? I don't want to be sore, 'cause when I go to batting practice next day, it's hard to swing a bat when your lats are sore. Every supplement has its role or value. There just has to be context to it. And I think a lot of people make the mistake of conflating everything with bodybuilding nutrition when, in fact, there are people who just want to do a triathlon faster. I mean, there are people who buy products at Bodybuilding.com who maybe don't want to gain lean mass, they just want to perform better. And you gotta take that in account. But the idea that if it helps or has a neutral effect, or if it's more than never and less than always, applies really to a lot of things. 'Cause even caffeine, which I love ... I love caffeine and I love creatine ... there are non-responders to caffeine and creatine. But again, what's the worst thing that can happen? Well, here's what

interesting, now that we have data on it. Worst thing for creatine non-responders is a non-response. That makes sense.

Well, now we're finding out that caffeine, there's a gene for caffeine, that you're either a fast or slow metabolizer. And oddly enough, we're finding out that if you're a slow metabolizer it may actually hinder performance. It gets a little tricky. And people say, "Well, caffeine's a drug. It's not technically a food substrate like creatine. Now, does the adage apply? "If it helps or has a neutral effect?" Well, oddly enough, with caffeine I think there's a self-selection factor. People figure out, they're like... And I remember, I thought people would be lying to me. They're like, "Ah, when I take caffeine nothing happens. I don't feel anything. In fact, sometimes I feel worse." I'm like, "You gotta be lying. That's baloney." And now the data on this gene for caffeine, it's like, wow, slow metabolizers of caffeine actually perform exercise worse, which is ... I'm like wow, that's really odd. I mean, what other genetic factors influence exercise performance as it applies to nutrition?

Nick: Interesting. They're worse in that they are too jittery to perform, to hold the barbell, or-

Jose Antonio, Ph.D.: No. Actually, time trials on a cycle. The responders do better cycling, there's a group that are neutral, and then there's actually a small group that gets worse, which I find really odd. But I guess, that's when you hear people say, "Hey, caffeine does nothing for me," and I'm like, "You're lying. It's gotta do something for you. It does something to me." Every morning. I need it.

Nick: How much we talking about here?

Jose Antonio, Ph.D.: A lot.

Nick: A lot.

Jose Antonio, Ph.D.: I got up at 3:45 to come here.

Heather: That's what I'm more interested in is the high dosage of caffeine. What's the lethal dose there?

Jose Antonio, Ph.D.: Well, actually there's data on caffeine overdose, roughly ... I think the lowest I've seen is, you could die on 10 grams, which is 10,000 mg.

Heather: Yep.

Jose Antonio, Ph.D.: Even some guy apparently wanted to take 20,000 mg. Why, I don't know, but he ended up in the emergency room.

Heather: That's crazy.

Nick: How do you control the experiment that is your life when you want to figure out if something is working? Say that you buy a bottle of branched-chain amino acids or glutamine, and you want to be able to tell, "Okay, is this the thing that's actually making a difference?"

Jose Antonio, Ph.D.: And the easy answer to that is, you actually don't know, 'cause there is a placebo effect. In fact, the placebo effect is real. Let me tell you a quick story. This one study where they told the subjects, "You'll get a placebo, middle dose caffeine, high dose caffeine," but they told

them, they said, "Okay, now you're getting a placebo. Oh, now you're getting a high dose. Now, you're getting the middle dose," but they actually got the placebo every time. Subjects performed better when they knew they were getting more caffeine, just because they were told. The idea that there's a true placebo effect is real. But here's the kicker: When you compare a supplement to a placebo, which is almost every study, and the supplement does better, then there is a real effect. Now, how do you know personally if there's an effect?

Well, if you're in a podium sport or a finish line sport ... because you run faster, bike faster, swim faster or jump higher-

Nick: Feel better at the end of the race, that's what I feel like ...

Jose Antonio, Ph.D.: That's another one, you feel better at the end of the race. If you're in a physique sport, you don't know. It's a guess because it's how you look.

Heather: Well, and that's exactly why this sport has so many followers with so many different ideas, and ... everyone's a researcher now. They're pulling up their own study or their own proof of whatever they think is correct.

Jose Antonio, Ph.D.: Right.

Heather: And I always turn to the placebo effect as, "Hey, even if it's just a placebo, that's still an effect."

Jose Antonio, Ph.D.: It's still an effect.

Heather: It's still, you know?

Jose Antonio, Ph.D.: It's a good effect.

Nick: One thing I wanted to ask you is, once upon a time and still ... I would say still now, it was all about, "What is in your pre-workout? What is in your post? It's like, "Ooh, look, we have citrulline, ooh, look, we have probiotics in your multivitamin, but it's these tiny little dustines-

Jose Antonio, Ph.D.: Right.

Nick: And now, everybody's into transparency and clinical doses. Does it end up being much better in the age of the clinical dose?

Jose Antonio, Ph.D.: What's the question again?

Nick: I don't know. It seems like some supplement companies are all about how much rather than just what now. Does it end up being demonstrably better?

Jose Antonio, Ph.D.: I think ... well, there's a saying in the drug industry or pharmacy, it's drug, dose, duration. In this case, it's supplement, dose, duration. But you can't do three S's or ... whatever. Drug, dose, duration. Supplement, what's the dose, what's duration? And dose is key. I mean, a lot of products are under dosed, and that can be a problem. Now, if they're under dosed, could you take them long enough to get a dose? Ah, conceivably you could.

Nick: Right.

Jose Antonio, Ph.D.: But let's take the simple one, caffeine. You have to dose properly to get an effect with caffeine, and the low end of the dose is about 3 mg per kg. Anything less than that, you probably won't get an effect. In that case, dosing is key. An amino acid like L-citrulline, dosing is key. You need to get gram amounts of it, not milligram amounts. If you look at some of these pre-workout products, it's milligram amounts. I think it's important that you work with a dose that at least shows some clinical promise. Otherwise, it is, it's kind of a fairy dusting, which is not fair to the consumer.

Nick: Right. Right. And where do you think timing fits in the priorities, then, if somebody is trying to get the most of a supplement that they spent their money on?

Jose Antonio, Ph.D.: Timing in general, or ...

Nick: Yes. Let's talk about protein timing in particular. You think, "Okay, here's ... you know, I've got my amount that I'm aiming for"-

Jose Antonio, Ph.D.: Right.

Nick: ... "and the sources that I'm aiming for." At what point do you need to start to get strategic about timing? Oh, I have to get it before or after my workout ...

Jose Antonio, Ph.D.: Right. Well, I think the challenge with timing is that the original timing studies were actually on carbohydrate, not protein. And we do know that particularly if you do prolonged cardio or you do two-a-days, the timing becomes critical because you gotta recover for the next training bout-

Nick: Right. Right.

Jose Antonio, Ph.D.: ... which is in the same day. A lot of elite endurance athletes do that. Football players do it when they do two-a-days and things like that. Now, in terms of protein timing, this is where it gets tricky, and I think there's been a lot of confusion. Let's say you need 200 grams of protein a day or 200-pound male or female, and you split it up during the day. Now, what do you do post workout? The recommendation I give is, we'll get 20 to 40 grams of protein a day. And I remember, a couple years ago, people were saying, "Oh, the timing, it doesn't matter, blah, blah, blah. You could just go home, hang out, take a shower, and then you could eat your protein later, because what matters is total protein per day," which is correct. Total protein matters per day, but you still have to distribute it. But that's not even the argument I would make. The argument I would make is this: Are you ever helped by not eating? Does not eating ever help you? The answer's no, it never helps you. Why would anyone choose to not eat? If you're done your workout and you're driving home ... let's say you got a 30-minute drive home or whatever. I mean, here you probably have a three-hour drive home. Just kidding.

Nick: 30 minutes.

Jose Antonio, Ph.D.: 30 minutes. Why not do the shake immediately post workout? Because not doing the shake confers zero benefit. And this is where I differ from a lot of scientists: I tend to take ... not I tend, I do ... I take a very pragmatic approach to this. It's like, is there a benefit or not benefit

to doing? If the benefit is marginal, it's still a benefit. If there's a benefit to not eating, well, then, I'd like to know what that benefit is, because I haven't found it yet, and that's where the protein timing issue gets really muddled in that people are like, "Oh, it doesn't matter what I do." Well, no, it does matter what you do, because not eating confers nothing.

Nick: No, I like that approach. I mean, the thing I tell people is, "If it's an effective part of your ritual-

Jose Antonio, Ph.D.: Yes.

Nick: "... if having your post-workout shake helps you remember to have a shake period, then ..."

Heather: That's right.

Jose Antonio, Ph.D.: ... it helps you remember to eat protein.

Nick: Then get in that anabolic window unapologetically at that point, right?

Jose Antonio, Ph.D.: Right. But no, here's what's funny: The anabolic window, let's say, stretches for hours, right? And the idea was, well, because the anabolic window could stretch for hours, it doesn't matter what you do immediately post workout; when, in fact, that's the wrong way of thinking. Well, to me, it's the wrong way of thinking. The right way to look at it is, well, if the anabolic window is that long, take advantage of every frickin' part of the window.

Nick: Right.

Heather: That's right.

Jose Antonio, Ph.D.: Why would you ignore it?

Heather: Load up at the beginning of the window.

Nick: Get two meals in it.

Jose Antonio, Ph.D.: Right.

Nick: Exactly.

Heather: You touched on that recommendation that we hear a lot, that 20 to 40 grams per meal.

Jose Antonio, Ph.D.: Right.

Heather: Another question that we get asked all the time is, how much is too much to eat in any one sitting when it comes to protein?

Jose Antonio, Ph.D.: Ok. Good question. How much is too much to eat? The answer to that is, nobody really knows.

Heather: Ah.

Jose Antonio, Ph.D.: That's why ... we know the minimum to stimulate muscle protein synthesis. I'd say go with the 20 grams. That'll work for most guys and girls. The maximum is unknown but, again, if ... let's say you're dealing with a ... let's deal with the extreme, the 400-pound sumo wrestler. 400 grams of protein. He's gotta eat a lot. He's splitting up his protein throughout the day. Is he gonna go by 30 grams a meal?

Nick: Right.

Jose Antonio, Ph.D.: He'd be eating 35 meals. I mean, come on. And even take an NFL lineman who weighs 300 pounds. To get 300 grams of protein, 30 grams a meal? I mean, you're crazy. And here's the thing: I mean, I don't want to get into a lot of hard-core biology, but think of this from an evolutionary standpoint. Human beings evolved, basically, to withstand starvation. And then they would gorge, if food was plentiful. Now, imagine you've been starving for two days. You finally catch a deer. You want to eat, and your caveman buddy says, "You know what? 30 grams of protein, that's it. Stop." And you're hungry. You just want to eat and eat and eat. You want the whole deer leg. It makes sense, from a biological standpoint, that your body can take in and utilize a lot of protein, certainly a lot more than 30 grams. That's nothing. That's a chicken breast. I mean, that's nothing. I go to Popeye's, have chicken breast, wings and legs and ...

Nick: Right. It's doing something. We just don't necessarily know what the rest of the protein is doing?

Jose Antonio, Ph.D.: Well, you're utilizing it for something. And here's the thing: If humans have adapted to survive famine ... and obviously, none of us undergo famine, but what happens when it's feast, you starve, you feast, you starve? There's gotta be a mechanism for your body to utilize 100 grams of protein in one sitting. Otherwise, we'd all be dead as a species.

Nick: Right. Right.

Heather: Welp, that makes perfect sense.

Nick: Now, you talked about high protein for the person who's 60 to 80. I also saw on your [Instagram](#) feed the other day something about creatine for the person who's 60 to 80. I know you're a big defender, or champion of creatine as a supplement.

Jose Antonio, Ph.D.: I love creatine.

Nick: Do you think we're getting to the point where the research is stacking up it's going to be considered a vitamin at some point, or is it too tainted as a sports supplement still?

Jose Antonio, Ph.D.: I don't think it'll be considered a vitamin, because technically you don't need it-

Nick: Right. Right.

Jose Antonio, Ph.D.: ... and you don't get a deficiency symptom. However, it may actually be healthier than taking a vitamin. My wife and I used to coach travel softball down in south Florida, and when my kids were young they played softball for about seven, eight years. I had my daughter, who was a pitcher, take creatine when she was little. I mean, 'cause it's a power sport. Everyone should

take creatine from a very young age to very old age, and I always say even if you don't care about the muscle stuff, 'cause a lot of people like, "Well, I'm not a bodybuilder," blah, blah, blah. That's fine. Take it for your brain. There's good data showing that it helps memory. It serves as a fuel, actually, for your brain. That is reason enough alone to take it. In fact, there's data that suggests that for ... if you compete in a sport where head trauma is a possibility ... soccer, the fight sports, mixed martial arts, boxing, football ... take creatine for your brain. It protects it.

Heather: Interesting. Now, just out of curiosity, 'cause you said, at the very beginning, that you discourage treating food like math or doing math to try to figure out what to eat.

Jose Antonio, Ph.D.: Nutrition should not be about mathematics.

Heather: That's what you said. If someone is not a food-scale person, they're not weighing every single calorie-

Jose Antonio, Ph.D.: Me.

Nick: Me, too.

Heather: Can you ... how would you ... what kind of signs would you look for that hey, maybe I need to increase the protein, hey, maybe I'm getting a little too high. Are there certain signs, symptoms that people can look for?

Jose Antonio, Ph.D.: Well, to me, I think it's a question of ... if you make the right food choices, you actually don't even have to count protein grams. I think if most people, let's say, eat three meals a day and then have two snacks ... technically, that's five meals a day ... but let's say in each of those meals they get 20 grams of protein. That is actually enough for most people, and guys, the serving size will be greater than, let's say, girls. And the emphasis would be on whole foods and whole protein and things like that. And if you need to do one shake post workout, that, to me, is fine. And you don't have to count anything. You're just looking at the kinds of foods you eat. What's interesting is, a lot of people even have a hard time with that. That's some simple stuff.

Heather: You'll notice someone get cranky 'cause they don't have enough sugar, but people get cranky if they don't have enough protein. Maybe you?

Jose Antonio, Ph.D.: I get cranky if I don't have enough coffee and white rice. Those are two of my favorites there. People think ... you know, it's funny, on [Twitter](#) ... it's really funny ... this guy accused me of being anti-carb. They're like, "You do all this protein research. You're such an anti-carb person." I'm thinking, "Has he ever sat down and had dinner with me?" I eat like a bowl of rice. I grew up eating rice all day. I was like, "This guy's crazy. He's crazy."

Nick: One other thing I wanted to ask. The winds of favor are always blowing for or against one supplement or the other. It seems like branched-chain amino acids are really popular, and then there'll be a community that's totally anti. And glutamine is one that we hear about all the time, where it was the be-all, end-all. And now, when you run a glutamine piece, everybody says, "Glutamine is an absolute scam." Now, you-

Jose Antonio, Ph.D.: I don't know if I'd use *scam*.

Nick: Or, "It does nothing unless you're a burn patient," is what we always hear.

Jose Antonio, Ph.D.: What if you're a burn patient?

Nick: Right, exactly. But you've written in defense of glutamine in the past, and I wanted to know where you stand on that particular supplement, 'cause it's one that bodybuilders are notorious for taking.

Jose Antonio, Ph.D.: You know what's interesting about glutamine, I actually published a review paper on it probably 20 years ago, saying that it had a role with mainly protecting the immune system. Now, I've always put a caveat to using glutamine, and the caveat is this: Unless you're training your ass off, it's not gonna do anything. When I say training your ass off, is it the equivalent to you running 50 to 80 miles a week. So... and it's easy to quantify endurance stuff, because it's mileage. I don't know how you quantify that with bodybuilding. Is it more volume, more sets, are they doing two-a-days? If you're training your butt off, then maybe glutamine will help just from the standpoint of protecting your immune system. And now that we're learning more about how your immune system is affected by your gut and your gut bacteria and all that stuff that I don't understand ... I'm trying to understand it ... maybe glutamine plays a role, because it serves as fuel for your GI tract or your intestine. I wouldn't discount it.

I would just say it's ... again, it's context. It serves a use for a small subset of athletes who work their tail off. I would say if you're grandma walking your poodle three times a week for 30 minutes in Boca Raton, Florida, you don't need glutamine.

Nick: Unless you're also a burn victim, right?

Jose Antonio, Ph.D.: If your dog's a burn victim-

Nick: Right.

Jose Antonio, Ph.D.: ... then give the dog glutamine.

Nick: Are there any other supplements like that, that come to mind where you think, "You know what? It has value, but maybe only if you are really pushing it."

Heather: Only if you're in this top one percent.

Jose Antonio, Ph.D.: Well, I think branched chains are one of those, has limited value. But, again, if not being sore is something you're trying to avoid, you don't want to be sore, I think it has utility there. A lot of the single amino acids like just leucine alone, taurine alone, I mean, there's data that show it can help either with muscle protein synthesis or with performance or something. But again, the utility is limited, but it doesn't mean it's useless. And I think it's weird, in this industry and sometimes in the science industry, people paint this black and white or ... it's a zero-sum game. Well, if you do this you can't do that.

Well, I remember, when I gave my talk on protein, one of the criticisms was, "Well, if you eat a high-protein diet, it limits the intake of fiber," and I'm thinking, "How the hell does it do that? So if I eat a steak, I can't have broccoli with it?" This either/or mentality not only exists with clinicians, but it even exists with scientists sometimes. It's the, "Don't take branched chains, 'cause whey protein's better."

Well, it depends what your goal is. And I guarantee you that, if you're riding a bike for four hours, you're not sucking down whey protein. Well, maybe you are, but you'll be throwing up. You're probably taking a branch chain amino acid cocktail with caffeine and sugar or whatnot. Context is critical for a lot of these supplements.

Nick: Definitely. Branched chain amino acids and endurance athletes have an interesting relationship, too. I feel I don't know a lot of endurance athletes who take them religiously, but after I started working here I remember thinking, "Bodybuilding and branch chain amino acids doesn't really make sense," because they're getting so much protein. But for an endurance athlete, branch chain amino acids seem to make a lot more sense.

Jose Antonio, Ph.D.: It does. In fact, that's where I've seen ... oddly enough, in south Florida, most of its use. And usually as something they consume during, particularly, a bike ride. It's hard to do it during a run, because you'd have to carry stuff. I mean, runners-

Nick: I chew them during mountain races.

Jose Antonio, Ph.D.: Ooh.

Nick: It tastes like shit. But I find them incredibly effective as just a-

Heather: He's a weirdo. It's okay.

Nick: Or I'll swallow a capsule, or if my throat's really dry-

Jose Antonio, Ph.D.: During?

Nick: ... 'cause I'm thirsty, I'll just ... during a race.

Jose Antonio, Ph.D.: Then you chug it?

Nick: There's little pills.

Jose Antonio, Ph.D.: Oh, you don't even wash it down-

Nick: I'll try, but depends on how much water I have.

Nick: Exactly.

Jose Antonio, Ph.D.: Oh, wow. Interesting.

Nick: But, I mean, within the context of competition or long training, you think that's the place where that can be most beneficial?

Jose Antonio, Ph.D.: I think it is. Or within the ... competition, hard training, because the next day you don't want to be crazy sore.

Nick: Right.

Jose Antonio, Ph.D.: That way, you could go out and bike or swim or whatever you're doing.

Nick: Right. And the soreness connection is one that we have used a lot over the years in articles here. Is that ... how do you benefit from that? It's not like taking Tylenol or something ...

Jose Antonio, Ph.D.: Right. Well, the NSAIDs are different, because the NSAIDs may actually inhibit recovery long term.

Nick: Right.

Jose Antonio, Ph.D.: Whereas branched chains could help. For instance, you say you compete in mountain bike racing?

Nick: No, just trail running.

Jose Antonio, Ph.D.: Trail running or stuff like that?

Nick: You could call it competing. I usually come in last ...

Jose Antonio, Ph.D.: Well, hey, you're still racing.

Heather: But he does it.

Jose Antonio, Ph.D.: In south Florida, I actually ... I'll use the word compete ... I race in standup paddling races. They range anywhere from three miles. The longest race I've done is a race around Key West Island. It took almost three hours to do. You're pretty beat up. And even training for it, you get beat up. And the last thing you want to be ... at least for me, and maybe it's a personal thing ... to me, being sore carries no value, 'cause it inhibits the way you train. And I think when physique athletes think of soreness, they think of, "Oh, I worked out hard, I feel good-"

Heather: Growth.

Jose Antonio, Ph.D.: "... it's good." And there is some evidence to show that damage is needed for producing hypertrophy, whereas for 99% of sports, it's not important. You don't want to be sore, because it inhibits the way you practice. Whether you're playing basketball, volleyball, football, rugby, lacrosse, being sore is a bad thing, actually, particularly when you're practicing a skill. And to me, one of the hardest skills is either pitching a baseball or hitting a baseball.

Nick: Terrible at both of them.

Jose Antonio, Ph.D.: Well, if you're sore, then you're gonna be really bad at both of them.

Nick: Exactly.

Jose Antonio, Ph.D.: Those are some circumstances or sports where it would be quite helpful.

Nick: And if somebody's looking to capitalize on it, is it important to take it before?

Jose Antonio, Ph.D.: I think before and/or during would help. And I think, again, the dosing is

probably more important. I would say 5 to 15 grams, and just play around with the dosing. You can probably figure out what works best for you. Because I think one of the things people don't take in account is GI distress. Lot of people ... like for instance, for me, pre-workout, I actually can't take anything other than caffeine. Anything else, I get an upset stomach. To me, I'm not taking protein, I'm not taking branched chains or anything like that. But in the middle of something, I can consume stuff. For whatever weird reason, I don't get an upset stomach. But if I do it right before, 20 to 30 minutes before, I'm like, "Uh, I just don't ..."

Nick: Even electrolytes or something?

Jose Antonio, Ph.D.: Yeah, it's ... I gotta be in the middle of it, for some reason. And obviously people experiment and they figure this out.

Nick: Sure. I'd like to have a big sandwich, like a really long hoagie.

Jose Antonio, Ph.D.: Is there at least one gram per pound of protein?

Nick: Absolutely. I order it special ...

Jose Antonio, Ph.D.: Good. Then you're on track.

Nick: Anything else, Heather?

Heather: No, I think he answered all the questions, yeah.

Nick: We've covered an incredible amount of information here. Thank you for coming and talking with us.

Jose Antonio, Ph.D.: Well, thank you.

Heather: Thank you.

Jose Antonio, Ph.D.: Thank you.

Nick: And we'll see if we can ... where do people find you online if they want to get in touch?

Jose Antonio, Ph.D.: Well, you can find me online. Actually, I'm the CEO of the International Society of Sports Nutrition. Website is ISSN.net, and you can find me online there. You can get my email. But I do want to say, our 15th annual conference, it's all sports nutrition, little bit of exercise training, is June 7th to 9th, Clearwater Beach, Florida, next year. If you want to go to the beach, 'cause I've seen the beaches here, they're not so pretty.

Nick: We have a beautiful river.

Heather: Yes. Yes.

Jose Antonio, Ph.D.: You got a nice river. Come to Clearwater Beach next June, and it's sports nutrition science for 2-1/2 full days. It's a lot of fun, and if you've ever been to a science conference, one of the first things people say is, "God, science people are boring as hell. It's just boring, boring,

boring." Our conference is not boring. You'd love it.

Nick: Highly caffeinated conference?

Jose Antonio, Ph.D.: It's highly caffeinated, highly boozed up, highly proteined up.

Heather: High protein.

Nick: Oh, wow.

Jose Antonio, Ph.D.: Protein boost caffeine.

Nick: It's your T-shirt, right?

Jose Antonio, Ph.D.: It's our tagline.

Heather: There you go.

Nick Collias: You might get decent attendance with that tagline. Great. Dr. Antonio, thank you very much.

Jose Antonio, Ph.D.: Thank you.

Heather Eastman: Thank you.



3 MYTHS ABOUT HIGH-PROTEIN DIETS DEBUNKED!

Protein plays an important part in everyone's diet, and even more so if you are a bodybuilder or do strength training. But is going heavy on the protein too much of a good thing?