



**Episode 5 Transcript**

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### ***Layne Norton's Hard Truths of Training***

**Nick Collias:** All right. Good morning, everybody. We all 'frozed up in this piece' in Boise, Idaho. You are listening to *The Bodybuilding.com Podcast*, and for the first time you're actually watching it as well if that's your thing, you're into peeping podcasts...

**Dr. Layne Norton:** Yes.

**Nick:** I'm thoroughly striped, Nick Collias, an editor of Bodybuilding.com. I'm also thoroughly surrounded. We have Krissy Kendall, science editor at Bodybuilding.com. Wait. Who's that? It's Layne Norton over there. Who let that guy in? I think we're going to have a science fight right here.

**Dr. Krissy Kendall:** Yeah.

**Nick:** She's the big Beta-Alanine lobby. I don't know. She sold out to big Beta-Alanine a long time ago.

**Krissy:** No. I'm more Creatine.

**Layne:** Big BA, huh? Big BA.

**Krissy:** Creatine has my heart.

**Nick:** Layne needs no introduction to most of you or many of you. He's a Cubs fan, first and foremost. That's what he's known most for.

**Layne:** Go Cubs

**Nick:** Record setting powerlifter, natural bodybuilder, physique coach, PhD, chief dude at Carbon by Layne Norton and Avatar Nutrition, had a new study accepted yesterday?

**Krissy:** Yeah. Congratulations on that.

**Layne:** Yeah. Thank you. Only took six years.

**Krissy:** Oh. I know. I know that feeling. I just had my dissertation published earlier this year, so I know that all too well.

**Layne:** Yeah. Someone said, "Why'd it take so long?" I'm like, "Well, you know, you get working on making money once you graduate. Sorry. Just being real. Then it just takes a back seat." So, [Dr.] Layman is a Professor Emeritus, so he's semi-retired. It would be like we'd do a revision and then six months would go by, and we'd do another revision. Then six months would go by. We started about three years ago really working on putting the manuscript together. Just goes to show how far ahead the research was at the time, because it's still novel.

**Nick:** Yeah. That was my question. It's like, "Yeah. No. I don't believe this anymore."

**Layne:** Yeah. Yeah. No. It was a good study, but it was very involved. We weren't really worried about many people replicating it, because it had been very difficult to do.

**Nick:** Okay. We'll dig into that a little bit, but he's in town hanging out with Bodybuilding.com. Did you shoot a video?

**Layne:** Yeah. I don't know if I can say, but we did a resolutions video. You guys should block that out if I wasn't supposed to say it.

**Nick:** No. No. No. We're going to rush the thing out today.

**Layne:** I don't know what's top secret, you know.

**Krissy:** You're good.

**Nick:** We're an open book around here.

**Layne:** Okay. Cool.

**Nick:** Yeah. You also put up a really solid [YouTube video](#) yesterday I saw about volume, which I thought was interesting. I wanted to dig into that a little bit and how some people kind of miss the point about volume. I don't know. There was a larger discussion in there just about making good decisions and applying a good level of scrutiny to what you do.

**Layne:** I think the main thing that I see in anything--politics, finances, fitness--is context is completely lost on people. It's not good enough to ask a question. You have to put it in context. That was the training volume video was trying to elaborate on that. Basically I've had people recently, I'm dealing with a few injuries and people have said, "Oh. You see, your training volume was a bad idea." It wasn't a bad idea. I won Nationals twice, got a silver medal at Worlds, and set a world squat record at the time. For me it was worth it. Maybe for you it's not worth it. Maybe you just care about being healthy and being able to play with your kids, and there's nothing wrong with that, if that's your goal, but if your goal is to be the best you can possibly be at whatever sport it is, injuries are

associated with that, but also you have to train a certain way. I knew that going in. I made a conscious decision. I talk about that with a lot of my clients. Whatever the goals are, fat loss, muscle gain, all those sorts of things, there has to be a very defined discussion about what your expectations and your goals are. Then that shapes how everything else works.

**Nick:** Sure. Yeah. Especially this time of year people gravitate toward a little bit of magical thinking about these sort of things, right?

**Layne:** Oh, yeah.

**Nick:** This is the year I'm going to do this magical program. I'm going to do this magical diet, magical technique even.

**Layne:** Even more, people ask me, "Should I track my macros during the holidays, like the meals?" I'm like, "Well, it depends. If you don't want to, if you really just want to enjoy the time, there's nothing wrong with that, but if you YOLO and you just eat whatever, don't be surprised when you've put on 10 pounds." Don't act like ... What you don't want to do is be completely mindless about it and say, "Well, I'd really like to stay lean, but I want to eat whatever I want." You don't get something for nothing. You know what I mean? If you say, "Well, I'd like to maintain most of my leanness, but I'd also like to back off a little bit on being so strict," and you have some cognitive restraint in there, that's fine. Again, it's a discussion. If you say, "You know what? What I value is being lean as hell and I don't really care about having dinner. I'll go and be around my family, but I don't want to eat that food," then that's fine, too. Your values don't have to extend to other people and vice versa. I think just as long as you have that...

**Nick:** Just be prepared to explain it to grandma.

**Layne:** As long as you have that conversation, "This is what I value," and that's okay.

**Krissy:** Yeah. How do you balance? You work with both spectrums. You work with currently and in the past with the extreme of competing, prepping on the top, elite, professional stage versus just someone who either getting ready for their first show, maybe not even a bodybuilder, but also powerlifter, complete different diets. How do you wrap your head around all of that, because it's personalized? You don't do that cookie cutter, "Here is your program, and I'm going to give everyone the exact same..."

**Layne:** Six ounces chicken, five almonds, and three spears of asparagus.

**Krissy:** Right.

**Nick:** You can smell the cookie, but you can't eat it.

**Layne:** Shout out to all those online coaches out there.

**Nick:** You can chew the cookie. You just can't swallow it.

**Layne:** Yeah. Exactly. I think that's a really big part of talking with your clients and making sure that your expectations and their goals are the same. I mean, I've had people who they want to lose 30 pounds in 12 weeks, and they're maintaining their body weight on very low calories. I have to explain

to them, "This is not a reasonable expectation for what you want. Here's what I think is reasonable." Then I have to make sure that they're either going to lower their expectations to match mine, or we're not going to work together.

**Krissy:** Right.

**Layne:** The one thing you don't want is their expectations to be here, yours to be here, and you hit yours, but not theirs. Even though you did the best job you could, they're unhappy still. Right? That's a big part of it. Also, like I said, context. I mean, I'm a fan of moderation for the most part on most of these situations, because I think moderation makes you... I'll give an example. When I was younger, in my 20's, and bodybuilding was my entire life and consumed me, I would be trying to be really strict during the holidays. What would happen was when I was not able to be strict I would just YOLO and say, "Screw it," you know what I mean, and go into 'hell with it' mode and eat whatever I wanted.

**Nick:** For days on end or for just a meal?

**Layne:** For a meal. You know, that sort of thing. Anybody out there who says you can't gain body fat in one meal, they do not know what they're talking about. I always do seminars. I'm like, "How many people have heard that, people say you can't gain body fat in one meal? I don't know where this came from." People raised their hands. I said, "How many of you all know that's bullshit?" Everybody raises their hand, because they all know that you can go out and have a real big meal, be two or three pounds up the next day. People say, "Oh. It's just water weight." Well, water doesn't stick around for a few months. You know what I mean? If it's water, in a couple days it's gone.

**Nick:** It's poop weight.

**Layne:** Water or poop weight. Yeah. Exactly. See, the solution's coffee. Just drink some black coffee and it'll run it right through you, or as also affectionately known as poop juice. It's one of those things that I found that if I allowed myself to relax a little bit, I actually became more adherent rather than less adherent, because I took those firm restraints off and it made it a little bit easier. I'm a fan of flexible dieting. A lot of people know about that. It's not because I want to eat candy and stuff all day. That's not why I'm a fan of flexible diet. I'm a fan of flexibility, because it improves sustainability. It improves consistency. That's why I'm a fan of flexibility for most people. If I thought that eating, quote unquote, "clean foods" was the best way to get to my goals and only do that, I would do that, because I'm all about my goals, but I also know that adherence is probably the number one thing for success with regards to nutrition. A lot of people just aren't honest with themselves about what they'll be able to adhere to. I mean, I see this all the time with people who are like, "This is my last cheat meal ever," as they're plowing stuff down their face. "I'll never cheat again." It's like, "You cheated three days ago. Stop it. Stop setting yourself up for failure, and start setting yourself up for success." I think we need to stop looking at... Especially with the obesity rates in this country, people go, "Oh. It's just will power. People just don't have enough will power." I think that's probably not true. I used to be one of those people. It was like, "People are just fat and lazy. They need to put the fork down." There's definitely an element of that. You know? I think that that's a pretty simplistic way to look at a pretty complex problem. I think we need to lower the barrier of entry to dieting for people, because a lot of people, they'll look at their fitspo on Instagram posting pictures of chicken and broccoli every day and they'll go, "Well, I could never do that, so what's the point." Well, no. You don't have to do that. If you could just cut down a few hundred calories a day, or maybe you can't get in the gym two hours a day, but can you get in 45 minutes? It's better than zero. Right? I think Les Brown said, "Start where you are, with what you have, where you are right now," something to that effect, or, "Do

what you can, with what you have, with where you are right now." I think that's a huge thing to understand. For some people ... I'm fortunate enough, I work from home, if I want to go train 3-4 hours a day, I can go do that. Some people don't have that benefit. I value being a high achiever in my sport. Some people say, "Well, you don't make any money from powerlifting. Why is that?" Because I want. Money, I can always make money, but how many people get to say they went to a world championship and got a silver medal? You know, that sort of thing. Yeah. Having those conversations about, "What's important to you?" I've even told people like, Listen. I'm a libertarian, if somebody wants to be fat, if they're happy being fat, who am I to tell them, hey, you should lose weight?" We all know people in the fitness people who are the most miserable people you have ever met, who have unbelievable physiques. Like when people go, "Oh, my god. If I could just be you for a day...", they're miserable. They're miserable human beings to be around. Not all of them. Most of them are fine. I have most of my friends in the fitness industry, but we all do know people who have great physiques, or a lot of money, or some job that seems really attractive and people go, "Oh. I just wish I had their life." Well, I think at the end of the day I like what John Lennon said when his teacher asked him, when he was in fourth grade, "What do you want to be when you grow up?", and he said, "I want to be happy." She replied, "You didn't understand the question." He said, "You don't understand life." That should be the goal, to be happy. Like I said, that's my long, convoluted answer to your question.

**Krissy:** Yeah. It was a good finish to the question though.

**Layne:** Like I said, if somebody's happy being fat, who are you to tell them they need to lose weight, or who are you to tell somebody what their goals should be? I think getting away from that and lowering the barrier to entry, and stop being so fit shaming, fat shaming, like who cares? If somebody else wants to do something, if they're not hurting you, why do you care what their goal is?

**Nick:** I think the barrier of entry is an interesting way to put that when we're talking about macros too, because that is sort of the dividing line between somebody who's maybe a long time Bodybuilding.com reader and somebody who's like, "What the fuck is macros?"

**Layne:** It's funny, because even back... I'll take credit for it. I was a big pusher on the [forums](#) of flexible dieting. We didn't call it that back then. It was me, Alan Aragon, and a few other people, and people would ask us, "Is this food okay?" We'd basically say, "Can you hit your macro-nutrient goals for the day? Then yeah, it's fine." You know? It became 'If It Fits Your Macros,' because that's literally what we kept saying over and over ... I think Eric Coodrite labeled that term ('IIFYM'). Then that became later flexible dieting, which was a little bit... They're the same things. People think they're different for some reason. They're the same things. Yeah. Lowering the barrier to entry and sustainability. I did a PhD in nutrition. I went to school wanting to find magic foods. If I did, I'd be peacing out, because I'd be a multi-billionaire by now if I find magic foods, but there aren't. There's really not. There's no good or bad foods. It's all just about context. You can eat too much of a, quote unquote, "good food." There's certain amounts of bad foods that you can have and they aren't going to hurt you.

**Nick:** But there aren't necessarily magic macros either. Right?

**Layne:** No. For sure.

**Nick:** It could be easy to say, "These numbers, when I eat this it's 100% accurate. I know exactly the



macros of what I'm eating," but that's not really the case either, is it?

**Layne:** No. I mean, everything works on a bell curve. You know what I mean? This is actually an interesting segue into here's Pipology 101... My program, Avatar Nutrition, that I helped design, which is basically an artificial intelligence algorithm that we use to determine macros for people based on their goals, and body type, and what not. When I was putting it together, I remember the guy who started it with me, it was originally just going to be like a calculator. I thought, "You know what? I don't like calculators, because I can come up with something that's going to work for about 60% of people, but based on what I know about Gaussian distributions and bell curves there's going to be 30 to 40% it's not going to work for." What do we do for those people? That's why we made it something to where depending on how... They would have to check in with weights, and body fats, and what not, and how they responded, the program then adjusted to them. I always tell people, "This is like training volume. Same thing." High carb, low carb, or high calorie, low calorie, it's all individual. High calorie for me may be low calorie for somebody else. Alberto Nunez. I don't know if you guys are familiar with him.

**Krissy:** Yeah.

**Layne:** Berto diets on 4,000 calories a day, and he's like 170 pounds. I'm 205 pounds. I'm more muscle mass than Berto. Sorry, Berto. If I eat 4,000 calories a day, I'm going to gain body fat. He can lose weight on it. Again, it's not high calorie, low calorie and you can just throw a blanket statement out there. It depends on the individual. Same thing with training volume. I had to get my squat volume up to about 40 to 50 thousand pounds a week for me to squat 668 pounds at Worlds, whereas my friend, Ryan Doris, he got close to that, and his volume was like two thirds of mine. You know? This is one of the things I tell people. It's like, "Genetics matter. They do matter." As much will as you have, they do matter. It doesn't mean you can't get better. It just means that you might have to work harder than the other person. I hear people lament that all the time. What I'll tell them is like, "Well, it's fricking life." Billy around the street was born and his family had \$3 million saved, and you were born in a broke family. It don't mean you can't become wealthy at some point. It just means you're going to be starting at the 20 yard line, and he's starting at the 50. You can still get to the goal. It's just a little more work.

**Krissy:** Yeah. I guess for me the frustrating part, and you explained it well, is that you can look at someone and think... The example you gave with you and Alberto and you see two extremely fit people and you think, "Okay. They must be dieting the same, training the same," completely different. You go on forums and everyone's like, "Okay. You got to eat one gram of protein per pound of body weight. It doesn't matter what your training is. It doesn't matter what your body size is," and we just give these absolutes all the time, and it just drives me insane. No matter how many times you try to tell people, "Look at this literature. Look at this research, and it's different." We come from very similar academic backgrounds. It's like we try to tell people, "Look at this. Read this." Sometimes it goes through one ear and out the other. Trying to educate people and open them up to experience different sides of things, it just doesn't seem to connect, or click, or they only want to listen to one person or believe one thing. Even going back to If It Fits Your Macros, somehow that got spun to, "I can eat Pop Tarts," and that became a big thing of, "Oh. If It Fits Your Macros means I'm going to eat Pop Tarts." That's not what it was originally about. Things get spun so...

**Layne:** That was kind of a proof of concept.

**Krissy:** Right. I get that, but it's like we take this one thing... I get where this one gram of protein per

pound of... I get where it came from, but it was one small thing and then it became this end all, be all. Everyone has to do this, and if you're going to follow that one thing, you've got to do that right. The same thing could be said about carbs, or fat, or depending on what diet you're going to do or what training program you're going to do, or if you want to have this sort of success, you got to do this sort of program, this sort of thing. When you work with people and you have a new client, how do you get them to not necessarily change what they're going to do, I mean, maybe, depending on where they're starting from, where they want to go, but to shift their focus or the way that they think, or can you even do that? Can you get them to maybe re-think some of their old training habits, nutrition habits, and the way that they process?

**Layne:** Yeah. That's a good question. One thing I think that's apparent when you were talking is when you do a higher education, like graduate school or PhD, one thing is it humbles you at a certain point. You realize, "Wow. I'm an idiot."

**Krissy:** Yeah. For sure.

**Layne:** "I don't know hardly anything."

**Nick:** Isn't that what people get that education for?

**Layne:** "I know a little bit about my corner of the universe." What do they call it? The Dunning–Kruger effect or whatever? Basically the effect is if you have no knowledge, you know that you have no knowledge. The most dangerous person is the person who has a little bit of knowledge, because your confidence level is very high. Then as you learn more your confidence level goes down. Then you get to a point where it starts to go back up. That's that PhD area. I remember the first time I went to present an experiment in biology. This was in 2008. I got reamed by a professor, I mean just absolutely... I knew what I was talking about, but I hadn't had the experience of verbal jousting with somebody who was very intelligent. It was like jab, jab, left hook, upper cut, you're out. I remember thinking, "I never want that experience again," so it made me get better. It also, going through those, being challenged... My adviser, Dr. Layman, was really good about that, about challenging everything I believed. It humbled me in terms of realizing that context is so important. Basically what I was trying to say is you understand the importance of that because of doing a higher education like that. I think one of the things, in terms of working with clients, like how do I get them going on the right path? First off, it depends on the client and their goals. If it's somebody who's like your average Joe, for lack of a better term, and they just want to lose some body fat, they just want to look better, they just want to be healthy, I'm going to try and mess with their stuff as little as possible. Because if I blow up their lifestyle, if they're used to going to McDonald's two times a day or whatever and cooking at home, or they're used to just living this complete what we would think is an unhealthy lifestyle, and I'm just going to throw at them, "Well, I'm going to need you to cook four egg whites and two whole eggs in the morning. I need you to have a salad for lunch," they might follow it for a few days or maybe even a week, but eventually they're going to go... My friend, Dr. Kori Propst, I recommend you guys check out her [YouTube videos](#). She's great. She's the director of wellness at The Diet Doc, which is owned by my friend, Dr. Joe Klemczewski. Kori has a PhD in psychology. I think she puts it really well. She goes, "You know, it's like your will power all comes from the same place. It's not like you have will power for your kids, and will power for your spouse, and will power for your job, and will power for diet, and will power for your training, they're all separate bubbles. It's all from the same pot." When do we find ourselves really having trouble adhering to a plan? It's where we're stressed out and the holidays are here. Hey, what do you know? We had a death in the family, and work is piling up, and all this kind of stuff. Do we want a plan that requires the maximum

amount of will power, or do we want something that requires the minimum amount of will power? I've always said, "I want something that requires the minimum amount of will power. Somebody can stick to it." Now, if they can go and cook every single meal, and pack their meals, and take them, and all that kind of stuff, sure, great, but we need to be able to have something that they can stick to even when everything goes to shit. That's where I start for that person. If I'm dealing with an elite athlete, that's a little bit different right now, because that last 1% or 2% starts to make a difference. That's why when people ask me about supplements, I get a lot of people say, "There's a really big backlash to supplements right now. Supplements don't help at all. You don't need supplements at all," which is true. You don't *need*, because by definition need is a requirement. You don't require, you don't need supplements, but to sit there and say there's absolutely no benefit to any supplements out there, that's just wrong. That's just completely wrong. Maybe for the person who's just looking to get their life together, lose 30-40 pounds, maintain that, and be healthy, and they don't have a lot of extra cash to spend, maybe it doesn't make sense for them to buy supplements. I'm never going to sit here and tell somebody, "Don't pay your health insurance or rent, because I need you to go out and buy creatine." You know what I mean? No.

**Krissy:** I would.

**Nick:** Have you seen her apartment? Crates and crates.

**Layne:** If you've got the extra cash, and it's something that's important to you, and you're a competitor, those sorts of things, then yeah. Then you make that call of what's important to me, and what am I willing to give up or sacrifice to get to that?

**Nick:** Sure. That can definitely apply to training too. Talking about volume, you can kind of have two approaches. I heard you outline recently in your video basically the max recoverable volume or the minimum effective dose. I'm trying to think of... [PH3](#), that's a high volume program. Maybe a beginner might approach that and think, "Well, I can do it, just because I want it so damn bad."

**Layne:** It's funny. Actually, I had somebody reach out to me and they're like, "Oh. Well, I tried PH3, and I made good progress on it, but then I backed off to a lower volume program and I made better progress, so obviously the low volume works better for me." No. You weren't ready for PH3. That was the difference. PH3 is not for the person who just started lifting. It's not even for the person who's intermediate. In fact, as Krissy knows, I wanted the Wilks entry score to be 350, not 300.

**Nick:** Oh. I recall that. Yeah.

**Layne:** The big wigs at Bodybuilding.com and said, "There's nobody at the office that really fits these requirements. We feel like we need to relax them a little bit." No problem. We relaxed them. Obviously people have had great success with it. We did a statistical analysis of a survey of 100 people, and the average increase on the three lift total over 13 weeks was over 100 pounds. That includes women put on an average of almost 80 pounds on their total. That's pretty awesome. Men, it was like 114, something like that. Women actually responded better to it than men did, pretty interestingly. My fear was I knew I was going to have people who were just beginners who were going to start this. The hard part about the program too is we tried to make it flexible with Amwraps and changing how that affected your next week's set up of weight, but at the end of the day it is a little cookie cutter. You can't be completely flexible with it. People say, "Oh, Layne. Do you do PH3?" Well, the concepts that are in PH3 I absolutely use, but do I use that specific program? No. When I was getting ready for Worlds that program would actually be too low volume for me. Now, that



doesn't mean it's low volume for everybody. For most people out there that's going to be a really challenging, high-volume program. We did have people say, "Oh. Well, I had tendonitis come up when I was on PH3," or, "I had this come up." Yeah. You train hard, those things happen. This is some criticism I've got. Well, I've dealt with lower back issue right now. I have a bulged disc as well as a herniated disc. Last year I had a hip injury as well as two herniated discs in my neck and people say, "Well, you see what happened." I said, "Well, yeah, but you forgot about the world record I set as well as the silver medal at Worlds." You know? If I just wanted to look good and be pretty strong, then I would train a completely different way. I wouldn't train like that.

**Krissy:** I think that's a huge problem we have is we don't think about goals, and we just see something. We don't assess our initial starting point. It's like, "Am I beginner, intermediate, or advanced? I don't really care. I want to do this program, and I'm going to do it."

**Nick:** Those are fairly arbitrary categories too. You don't know who's...

**Layne:** That's true.

**Krissy:** Right. How do I assess that?

**Layne:** You've got advanced people who will make progress on low volume, because they're genetically less and vice versa.

**Krissy:** Right. Yeah. Even like diet or whatever, as we discussed before, what is my goal? If it's just to lose a few pounds, I don't think I should be doing a diet that a IFBB Pro is doing two weeks out from stepping on stage. If they're going to post what their macros are two weeks before, and I see that on an Instagram, and I'm going to say, "That's my starting diet," that is setting me up for failure, just like I would if I was to say, "This is my first day ever ..." This is an extreme case, but, "First day ever in a gym. I'm going to do PH3," very extreme.

**Nick:** I mean, you do see people in the gym everyday who are probably saying, "You know what? I feel good. I'm going to push it so hard today. Tomorrow I don't feel good. I'm going to dial it back this much."

**Layne:** That's when you do this.

**Nick:** Right. Exactly.

**Krissy:** Yeah. It's just that idea of...

**Nick:** I'm wondering, how do you get that person on that?

**Krissy:** Yeah, just like seeing all these fancy, shiny things and being like, "I want that."

**Layne:** Squirrel!

**Krissy:** Yeah. Then not knowing like bring it back in, and how do I know what works for me? You call it the sniff test, and I love that.

**Nick:** The sniff test. Right.

**Krissy:** Is this for real? Does this work?

**Nick:** For a program.

**Krissy:** Yeah.

**Layne:** That's why I like the concept of minimum effective dose. That's why I like that.

**Nick:** For gen pop you like the minimum effective dose?

**Layne:** Even for advanced athletes, because I think max recoverable volume and minimum effective dose are really close together. I think they're really close together, but I know how the personalities are in the fitness industry and in bodybuilding and powerlifting. If I say max recoverable volume, people are going to go ape shit, whereas if I say minimum effective dose, they'll pull themselves back a little more. Now, that doesn't have to be static either. When I was four weeks out from Worlds and trying to peak we were going for max recoverable volume. In fact, I was definitely over trained heading into the last week, but that's what elite athletes do. They over train purposefully. Then they do a taper, and they have a rubber band snap back effect. You actualize gains as I call it. Yeah. That's why I don't post my macros that often, or my diet, or my training. I'll post my training every once in a while and people will go, "Oh. Well, what about this, this, and this?" No. No. No. You don't understand. This is mine. You don't have to copy it. In fact, it probably *shouldn't* look like yours. That's the biggest thing is the individualization of things. Like I said, that was really my major struggle with PH3 and why I'm so proud of Avatar is Avatar is basically nutrition that's personalized, but automated. I felt so comfortable with that, especially now. We've had over 7,000 members, and it's worked really well for about 99% of people. With designing programming, it's tough. There's a lot of inputs that you have to go into that. Without knowing what somebody's... This is the same thing, like I tell people, "I need to know what you're eating right now. If I don't know what you're eating right now, I can't make recommendations for going on in the future. Same thing for training. If I don't know what you're doing right now, how am I going to make recommendations for moving forward? If I don't know what your current training status or volume is...?" Because I can look at somebody who's really advanced and say, "Well, they must be on high volume." They might not be. They may be very genetically blessed and able to make progress with very minimal dose. This is also the same thing with looking at pro athletes or professionals and saying, "I want to do that." There's two situations. A lot of these guys are so genetically blessed, they don't have to train that... Most of them do train very hard, but some don't have to train that frequently or that high volume to make progress. With regards to IFBB, drugs also come into play as well. You don't have to up the volume. You up the dose. Do you know what I mean? No offense to anyone out there. I'm not saying they don't work hard. I have friends who are IFBB pros who are some of the hardest working guys I've ever been around, and gals. I am not trying to dismiss hard work by any stretch of the imagination, but it is a confounding variable. It doesn't mean that what they're doing applies to you. In fact, people will say, "Well, most IFBB pros train each body part once a week, and you're training everything two, three, four times a week." I say, "Well, yeah. I'm natural." Okay? They're going to have artificially elevated levels of muscle protein synthesis *all the time*. The effect that training is going to have is going to be a drop in the bucket sometimes compared to that, whereas this is what is going to be the impetus to change my body composition is training. People want to say, "Well, steroids don't work without training." I'm sorry. That's not true. There are studies out there showing... They did a study where they took people, put them on steroids, training alone or training plus steroids. The group doing steroids alone gained more muscle than the group training. Now, the group that did training plus steroids obviously

did even better. I hear this a lot. It's kind of a side tangent, but it drives me insane. People go, "Well, you have to actually train harder when you're on steroids."

**Krissy:** No.

**Layne:** Really? Steroids are somehow catabolic? That's interesting. You guys are so good you're just trying to make it even tougher on yourselves. That's what you're saying, right? It's like the people who argue that sumo deadlifting is somehow cheating. It's like, "No. If sumo deadlifting were inherently easier, every single powerlifter, without exception, would do it." They're not purposely trying to make it harder on themselves. It's just that the people who are genetically predisposed to be very good deadlifters tend to be conventional pullers actually if you look at the data. Most world record holders are doing that conventional. That's another great example of what works for one person might not work for another person. It'd be the same thing of me trying to squat like Tom Platz. My squat form is very well known as me having a lot of forward lean because of how my levers are put together. I have femur lengths of somebody who's about six foot two, and I'm five ten. I am not how you would draw up a great squatter. I make it work, because I'm really hard headed, and I have very strong lumbar as well. I have a very strong posterior chain. If you look at me in the bottom of a squat, my back angle is about where you'd start a conventional dead lift. Telling me to try to squat like Tom Platz, where he's completely upright, is like telling Krissy to grow five inches.

**Krissy:** Yeah.

**Layne:** It's not going to happen.

**Nick:** We tried.

**Layne:** Yeah. Exactly.

**Nick:** No. I heard something else in there too, implied in there about full body training versus this strict bro split.

**Layne:** Bro split, I love this...

**Nick:** We had a piece from [Charles Staley](#) recently where he said, "You should be training basically full body until you hit the 300, 400, 500 on bench, squat, deadlift," I think it was. He said that's the benchmark he uses. What sort of benchmark would you say to someone, like, "You know what? Stay full body until," this?

**Layne:** I think I would disagree with Charles. I think that you don't have to be full body. In fact, I think for beginners I think that, again, you're going to need minimal training. I think training everything a couple times a week as a beginner is just helpful in that you are learning the movements. People don't think about weightlifting is a skill, but it's a skill. I would say you have one day that's a harder-ish day. If you're a beginner, you don't even need to train to failure. You're going to get so many gains just from actually picking things up.

**Krissy:** Lifting a weight.

**Layne:** Yeah, lifting things up and putting them down. Krissy knows. We call these newbie gains.

**Nick:** It's movement practice, too.

**Layne:** It's also why a lot of the studies used untrained people, because they can ...

**Krissy:** Positive findings.

**Layne:** Yes. They're easier to publish. That doesn't negate those findings, but it just means in that population that's what they found. It doesn't necessarily mean the same thing. Yes. I think whole-body training may have a benefit for people who are really crunched for time. Maybe you do a squat movement, a press movement, and a pull movement, and that's your day, because you're hitting all your major muscles groups, even your biceps, triceps are all getting worked. You can do that an hour. You can do that three times a week, and that's maybe better than going in and doing one day where you're doing legs, and one day where you're doing chest and shoulders, and one day where you're doing back and arms. That might be better. There's evidence that you can take the same volume and spread it out over multiple sessions and there seems to possibly be a benefit to that. We know with regards to protein intake that there is an upper threshold where just pumping in more proteins does not further increase anabolism. We think training is probably the same way, but we don't know where that threshold is. To be honest, it's probably different from person to person. That will be something interesting in the future to see what the research shows on that. I know my friend, Bill Campbell, he has a graduate student named Andres. Andres did a recent DUP study. That's daily undulating periodization, for people who aren't familiar, which is what PH3's based on. They did it where they trained three days a week, squat, bench, deadlift, or six days a week, and they cut the volume in half. It was either four sets on each or two sets on each. They found no difference in the outcome. There were no differences. The question becomes if you pump that up to eight sets versus four sets, would you find a difference? Maybe then you do, because maybe then you're going over that cap with the eight sets, whereas four is under that and you're still getting some benefits from spreading it out. We don't know the answers to those questions. As Krissy knows, when you do research usually you'll answer one question and then you get ten others with it.

**Nick:** One thing I wanted to ask you about also is, aside from thinking about just big programming, nutrition, there are also new techniques that come up all the time, and [blood flow restriction](#) training is one of them that you've done a video about with us.

**Layne:** What's up, J?

**Nick:** I wanted to ask you about that, just because it's relatively new. When you encountered it you probably were a fairly experienced lifter, academic even at that point. How did you go about finding out number one...?

**Layne:** You're going to love this story.

**Nick:** ... is it safe? Number two, is it legit? Is it appropriate for you? Then how do you use it? Something new comes along, what's the story of how it...?

**Layne:** My little shout out there was to my friend, Dr. Jeremy Loenneke.

**Krissy:** Hi, Jeremy!

**Layne:** ...who did his PhD same time as you in Oklahoma, right?

**Krissy:** Yes. We were at Oklahoma together. Oklahoma Sooner.

**Layne:** Yeah. Jeremy is ... What day is it? Saturday he will be laying on his floor, because he believes that laying on his floor actually gives the Oklahoma football team a greater chance of winning.

**Krissy:** Yes. We usually start our texts back and forth about five, ten minutes into the game. Then it just continues on from there.

**Nick:** It won the World Series for the Cubs for me. I was laying on the floor.

**Krissy:** We do our normal, "Are you wearing what you wore last week? What did you do differently?"

**Layne:** Jeremy will be texting me like, "I hate this. I can't stand this. Why do I feel this way? Why do I let something like this affect me so much?"

**Krissy:** Quite possibly one of the most intense human beings on the earth.

**Layne:** Jeremy is the most intense human being I've ever seen. I could do a whole podcast just on Jeremy's stories. This is a professor at Ole Miss, by the way. Jeremy is the most intense and probably funny individual I've ever been around, because he dead pans everything. But when I was a graduate student in 2007, Jeremy was an intern... Is intern the right...? He was doing I think it was an internship in Dr. Kim Huey's lab at Illinois right across the street, and he trained at the same gym as me. He knew me from the forums. We hung out a little bit, and we really got along well, because I'm intense, and he's like me times 10. I had just got done reading a 40 page meta-analysis of hypertrophy training. As I was reading through it there was this section on Kaatsu training. I kept reading this Kaatsu training. They are showing measurable hypertrophy benefits in six weeks of this Kaatsu training in trained individuals, which that is very hard to show. That's very hard to show. I'm thinking, "Damn. I want to try it. What is this actually?" Well, it ends up it's where they restrict not blood flow to the limb, but the venous return of blood to the heart using these cuffs, these specialized cuffs called Kaatsu devices. This has been around for a while actually. I think it's been around since the 70's. Most of the research originally was done in Japan. I'm like, "Okay. How do I get my hands on these things?" It turns out these cuffs are like \$10,000. I'm like, "All right. How can I replicate this?" The first thing I tried was like red exercise bands, and it didn't seem to do anything. The next thing I tried was Velcro Harbinger belts. I tried that, like reducing blood flow or blood flow restricting with those. They actually call it at the time occlusion training. Jeremy's really the one who was stickler about, "No. It's blood flow restriction, not occlusion." That seemed to do a little bit better. Then I remembered one day I was getting ready for a powerlifting meet, and I was training, and I was putting knee wraps on. I remember how pumped my calves would get. I thought about that fluid shift. I thought, "That's actually pretty significant. I wonder if that would work." I did that for quads. I started doing that, and it definitely seemed to cause a fluid shift. Something was going on. Well, I was doing that one day in the gym, I think actually one of the first days I actually tried knee wraps for legs. Jeremy came in. He's like, "What are you doing?" I was telling him about the training. He's like, "That sounds stupid." I'm like, "I know, but look at this research."

**Nick:** Look at this pump.



**Layne:** Yeah. Exactly.

**Krissy:** More importantly...

**Layne:** He tried it, and he was very intrigued. He went and did a PhD on that, now is a professor, and has published hundreds of papers.

**Krissy:** Hundreds. So many.

**Layne:** He's a beast when it comes to publications. I completely take all credit for blood flow restriction research in the United States.

**Nick:** I don't recall that being the question.

**Layne:** You know, I have to make it about me first.

**Nick:** No, of course...

**Layne:** It was very interesting in that the first thing I thought about was, "Well, is this safe?", because you're talking about blood flow restriction. The way it works, we're not exactly sure of the mechanism, but it looks like there's something to do with metabolic byproduct accumulation as well as fluid shift, the actual swelling of the muscle cell. It seems to be some kind of hypertrophy benefit. Essentially what you're doing is you're not restricting arterial blood flow to the muscle, but you're restricting the venous return. One of the cool things actually was Jeremy was able to show to validate that knee wraps were actually a really good tool for blood flow restriction. This meant the people at Kaatsu didn't really care for him very much, because it's very difficult to sell a \$10,000 device for BFR when knee wraps will do the same thing. I actually got in a debate with the head coach of the Texan's strength and conditioning on Twitter, because he was criticizing me for using knee wraps. I said, "Here's this study validating them." I looked on their page. They bought the Kaatsu cuffs. I'm like, "I understand you have to validate the \$10,000 you spent in your budget, but I'm sorry, bro, you could have used knee wraps." That was pretty cool. What it shows is that you get metabolic byproduct accumulation, you get a fluid shift, and we think that has something to do with how this is able to cause hypertrophy, because you're using very light weights. You're using 20, 30% of a one rep maximum. I love Dr. Stu Phillips, but one thing I'll disagree with him on is he said, "Well, you get the same benefits just from taking the same light weight to failure." That is true. You can, but if I take somebody who's well trained and put them on 20% of their one rep max, they will not be able to get failure. They will, but it will be a long time before they hit failure, whereas blood flow restriction will get you there much faster. It's just much more convenient and more fun.

**Krissy:** I was telling Nick about I was talking to one of my colleagues and they were doing some stuff on low weight to failure. They had to send one of their subjects to the hospital, because of Rhabdo.

**Layne:** Yeah. Rhabdo.

**Krissy:** I was like, "That doesn't seem safe, this whole low weight ..."

**Layne:** BFR actually causes very little muscle damage.

**Krissy:** Exactly. When you're also not having to do ... I think she had done 60 or 70 bicep or elbow flexion, because that's how long it took to go to failure. I was like, "That sounds miserable."

**Layne:** You could have done 20 to 30 reps in BFR, 20 to 30, then 10 to 15 for three successive sets after that. You'd be good.

**Nick:** For that moderately-trained, not super advanced, lifter out there who hears that and thinks, "This is the magic arm technique," is that free volume for them?

**Layne:** It's not any better than lifting heavy. The research shows very clearly that it's the same benefits as lifting heavy for hypertrophy.

**Krissy:** I hope everyone heard that.

**Layne:** Actually lifting heavy you'll get stronger than you will with BFR, because it's more specific. However, if you're somebody who's injured, like I am right now. I think where it really shines is with injury, like we were saying. There was actually a case study, a guy who emailed Jeremy. He thought he had torn a ligament in his knee. He was going to go get surgery on it. He had been doing BFR. He asked Jeremy if it was safe. He's like, "Well, talk to your doctor, but with the light weights you're using it's probably fine." When they went in it wasn't a torn ligament in his knee. He had broken his femur. The doctor, he's goes, "I'm not going to do surgery on you, because this is already healed. He's like, "What did you do?" The guy was like, "Well, I did BFR for three weeks." The doctor was like, "I don't know what the hell that is, but keep doing it." That's just one case study. We don't know, but there seemed to be maybe some benefits for bone health as well. People will say the safety thing, it sounds bad. You're restricting blood flow. In fact, Jeremy, he gives a speech at our camp every year. The last year was fabulous, because it was just him putting up quotes from people online and then destroying them. The first quote was... The title of his talk was, "Blood flow is good. You're an idiot." Jeremy's like, "I wake up in the morning and I feel pretty good about myself, and then I read this. I know blood flow is good. I know that. Don't you think we thought about that? The second part we can debate, but I know blood flow is good, but think about what exercise does. We're restricting blood flow, yes, the venous return, but short term. We're doing it for a few minutes. To actually cause tissue necrosis, or thrombosis, or something like that, that is a *sustained* thing that happens. It's not a short term thing. To cause tissue necrosis, you would be in such pain there is no way you would keep the wraps on for that long period of time. Maybe there's some Navy Seal out there who could do it, but everybody, they would take them off. There's just no way." It's a good question to ask. Think about what exercise does in the short term, raises your heart rate, raises your blood pressure, increases inflammation, increases reactive oxygen species, all these things that if you just told somebody that, are negative. If somebody was completely ignorant about exercise, didn't know anything, but they knew about health, and we told them all the things that exercise did, they would say, "Oh, my god. That's terrible. Don't do it." Exercise is like a vaccine. It gives you a controlled dose of a stressor that allows your body to better handle that stressor. What kind of inflammation's actually bad, for example? Long term, low level, sustained inflammation, not short term, truncated... It's the same thing when people say, "I don't want to take leucine, because it activates mTOR, and mTOR has been associated with cancer."

**Nick:** Right. IGF-1, yeah...

**Layne:** There is a difference between eating a protein meal that has a short term, acute, truncated response of mTOR, versus a disrupted cell that is constantly sending a signal to the DNA to

replicate. That's completely different. That's two things scientists aren't good at, correlation versus causation. I hate that, because they should know that. Also short term versus long term. We make a big deal out of short term stuff that may not even matter. I think, my hypothesis would be that by restricting blood flow short term you're actually improving blood flow. There's some evidence to suggest that as well. In fact, astronauts have a lot of problems with blood flow in space. They did studies looking at not even resistance training, but just restricting blood flow for like 30 minutes a day.

**Nick:** In a weightless setting?

**Layne:** It was either that or unloaded... and showed better blood flow. In fact, this is one thing where, again, I'll disagree with Stu Phillips, because there is something different going on with BFR, because they showed, one of the original studies on BFR where they got interested in muscle growth, was they just had people walk. Untrained people just walked under blood flow restriction and their legs grew. They got bigger. I'll say that again. Just from walking their legs grew. Now, if I put BFR wraps on and try to walk are my legs going to grow? No. I'm way too advanced for that, but let's say you can't do any training, like you're hurt, that sort of thing, that would attenuate muscle loss, or for somebody who's untrained that would help you grow muscle, if they can't train. Even people who are bedridden, they did intermittent BFR and showed that they retained more muscle than people who didn't. There is something going on that's not just train to failure. If that was the case, we wouldn't see it, because you can't walk to failure. You know what I mean? Well, I guess you could, but it would be very difficult.

**Nick:** That's my workout after this actually.

**Layne:** Exactly. I kind of brushed around the safety issue, but it seems to be very safe. I mean, there has been tens of thousands of subjects through these studies now, and the only study, it was a case study, there's only one ever showing any kind of negative benefit to BFR. It was a case study, so you can't even say it was BFR. There was a hockey player who reported to an ER, and he had rhabdomyolysis. He said that he had played hockey and done blood flow restriction training.

**Nick:** At the same time?

**Krissy:** No. I don't think at the same time. That would be tricky.

**Layne:** The problem I had with that study was at the end of it when the doctor's released him they said, "You're fine to continue what you were doing." If you think something actually caused rhabdomyolysis, if you're a doctor, why would you tell them they could keep doing it? That makes me think that they... Rhabdo is actually one of those things that's over-diagnosed in the medical community. I had a client who his mother called me one day. He was in the hospital, and the doctors had said he rhabdomyolysis. I'm just like ... This guy is somebody who had trained for like six years and didn't take a long break or anything like that. For those who aren't familiar, rhabdomyolysis is usually in untrained people who try to go too hard, you can break down so much muscle tissue that your kidneys cannot keep up with the excretion of the byproducts. It can actually shut your kidneys down and kill you. There's actually a few people every year who die from it. Usually they're either people who are untrained or usually it's people who had trained previously, who have a lot of willpower and stamina and are able to push themselves past where they probably should. Actually, I think a couple years there was a guy who had been in the Navy, and he hadn't trained in a long time, and went in and did a really hard Cross Fit workout, and ended up dying from rhabdo. This guy, his

mother called me and said, "Connor's been diagnosed with rhabdomyolysis."

**Nick:** You gave my son rhabdo!

**Layne:** No. No. She was very nice about it. Yeah. The first thing that went through my mind was like, "Well, here we go. I'm about to get sued." I actually wasn't doing his training. He was doing his own training. I was doing his nutrition. I put him on the phone and I said, "Well, did you have a really, really hard training, like way out of the ordinary?" He's like, "Not really." I'm like, "Well, are you really sore?" He's like, "No." I'm like, "Do you have a fever? Are you peeing a lot?" He's like, "No." I was like, "What was your symptom?" He's like, "Well, my stomach hurts." I'm like, "Okay."

**Nick:** Classic rhabdo.

**Krissy:** Or taking creatine, because creatine also causes rhabdo.

**Nick:** It gives you rhabdo. Yeah.

**Krissy:** Sorry...

**Layne:** I said, "Okay. What was your blood work like?" It turns out that his creatine kinase levels, which is what they use to diagnose this, were *modestly* elevated. I'm like, "Listen. I'm not a physician, but I don't think your son had rhabdo." I was like, "Did you change anything in your diet, anything like that?" He's like, "Well, I started taking a prebiotic." I'm like, "Oh. You changed your gut flora. You just have gas." He called me three hours later. He farted three times and left the hospital and felt better. It's like how was I able to diagnose this guy from a thousand miles away and the doctors missed this? It's unfortunate that, like I said, rhabdo gets over diagnosed. If you look at somebody who weight trains, they're going to have elevated levels of creatine kinase, because they're breaking down muscle. It doesn't mean because it's outside of the normal range that they have rhabdo. Yeah. I question that. Even if that's the case, if let's say that guy really did have rhabdo from BFR, people get rhabdo from regular weight lifting. Why does that make BFR ...? If anything, BFR has been shown to be just as safe or *more* safe than regular weight lifting. The one caveat is I'll say is you need to watch my video on BFR training on Bodybuilding.com.

**Krissy:** Do it right.

**Layne:** Don't keep the wraps on for 40 minutes on end. After you do a cluster of four take them off. Then do them back up after you've had some chance to rest.

**Nick:** There's finding that sweet spot of tightness. I feel like you see a lot of wondering about that.

**Layne:** If you're talking at knee wraps, you're probably looking at a seven out of ten tightness level. The easy way to know is if you put on what you think is 20% of your one rep max on whatever exercise you're doing, and you can't get close to hitting the reps, either the weights are too heavy or the wraps are too tight. If you're in pain before the exercise starts, the wraps are too tight. You'll be in pain while the exercise is going on. Anybody who's done BFR knows it's very painful.

**Krissy:** It is. I did several studies at OU, and it is not comfortable.

**Layne:** It's not.

**Krissy:** It's bearable. That's the difference. It's uncomfortable, but it's bearable.

**Layne:** Think about the best pump you've ever had, multiple it by 20, and then realize it's going to be the worst pump you've ever had.

**Nick:** So you're saying that's the worst pump you've ever had.

**Layne:** Yeah. You'll see the magazines be like, "Skin-splitting pumps." No. You don't know about that skin-splitting pump life until you've done BFR, trust me. I look at things as I don't think BFR's a magic tool. I think everything's tools in the tool box. I use my screwdriver a lot more than I use my jack hammer, but I still got my jack hammer in my tool belt if I ever need it. I do a lot of BFR, especially when I'm getting ready for powerlifting meets, because I still want to maintain my arms and some of my aesthetics, what little I have, for you Internet trolls. I still want to maintain some of my aesthetics, bruh, so I will do a lot of BFR, because at the end of the day I am just so beat up from squatting, benching, and deadlifting heavy all the time I don't feel like doing heavy barbell curls, or triceps pressdowns, or whatever it is. I want to do something light that I can get through really quick, pump a lot of volume in a short period of time, and get out.

**Nick:** Okay. Maybe that's the value of it then for that person out there.

**Layne:** I think also for people who are injured, like we talked about. A lot of times if you're injured, you can't do your normal training, but you can usually do 20% of a one rep max. Usually you can do that, or if you're traveling, in a hotel gym, and they've only got 50 pound dumbbells, it goes up to 50 pound dumbbells.

**Krissy:** Yeah. Good point.

**Layne:** Now, for people who are really strong like me, 50 pound dumbbells ... God, that sounded bad, didn't it?

**Krissy:** Yeah.

**Layne:** When you get to be like me...

**Krissy:** I mean, a little bit.

**Nick:** I would never reach failure with 50 pounds.

**Layne:** I could never reach failure with 50 pound dumbbells. You're weak, and you should feel bad. If you're in that situation where you're traveling, you don't have those options, well now you can actually get a really good workout in. I've done this on cruise ships where I took... I don't use wraps for arms, because it's too hard. You have to kind of pin your arm and... The cuff is actually too wide as well. There's evidence that the width of the cuff makes a difference. I use what's called quick release medical tourniquets. You have to really crank them down, because the fabric is different, but you crank them down to about a nine and a half out of ten, and they're really convenient. You can find them online for like 12 bucks for a set of two. Yeah. That's kind of what I use it for is when I'm traveling and those sorts of things, or when I'm injured, or I just don't feel like lifting heavy.



**Nick:** I don't know how much time we have left, but I wanted to ask you a little bit more.

**Layne:** Probably not much, because I talk a lot.

**Nick:** Well, we hinted at the paper that you've been working on for all these years, but I wanted to get the takeaway from that as well, because it's about...

**Layne:** How much time we have?

**Nick:** ... protein, protein cadence.

**Layne:** We have about an hour and a half, right?

**Krissy:** Dan's like, "No. Please, no."

**Nick:** Thinking from the perspective of somebody who thinks, "God, all those macros, there's three of them, I don't want to have to dial in all of them."

**Krissy:** There's *three*, Nick...

**Nick:** This one just focuses in on protein basically, protein pacing...

**Krissy:** You can dial in on three. You don't care about fat. I know.

**Nick:** If somebody, they just focus on protein, basically, according to those sorts of parameters, which you can discuss, and let the chips fall where they may on the other two, is that enough?

**Layne:** There's evidence that if you're going to focus on one, you probably should focus on protein, because if you're eating enough protein, you're more satiated. You're probably not going to overeat as much on carbs and fats. Basically the results of our study was when I got to Illinois, there was a lot of data out there on leucine in terms of purified solutions. They would give leucine, and under certain conditions they would show an increased muscle protein synthesis. What we didn't know was did that actually make a difference in the whole meals, because that's a different question. Also, does it actually make a damn bit of difference on long term body composition or muscle mass? Krissy knows this. You can do a lot of short term stuff with markers and what not. A lot of times in terms of what it does for long term it means absolutely nothing. We had that question, like does this actually matter? We designed a study where, this is after a few studies before this that kind of built up to it, but to look at, "Okay. We're going to feed different sources of protein, same total protein content and even isocaloric." In fact, and this why nobody was going to replicate the study anytime soon, we had 110 animals in the study. Again, yes, they were rats. I posted this on my Facebook fan page. People, "Oh. I stopped reading at rats." Don't accept any medical help then, because all those studies started in rats, too. Okay? By the way, most of this stuff's been validated in humans since then. Rats are actually a really good model for protein metabolism. Guess what? Humans suck as test subjects.

**Krissy:** They really do.

**Layne:** They don't do what you want.

**Krissy:** They really do.

**Layne:** They don't do what you want. Rats will do what I want.

**Krissy:** They're not compliant. They drop out. They don't show up.

**Layne:** Oh, well. "Sorry. I know you were up at 4:40 in the morning, but I forgot that I had the appointment to come in and get my body comp done." How many times do you hear something like that?

**Nick:** The answer is install a feeding tube in your room. If it fits your tube, that's the next...

**Layne:** What it should be is you hook up a tube and every time they eat off the plate it gives them a shock, an electrical shock. I'm sure IRBs would be fine with this.

**Krissy:** Easily.

**Layne:** We had 110 animals. We fed them three meals a day. We taught them to meal feed. A lot of problems with the studies out there is they just throw it in their chow, and they just ad libitum feeds, and they just graze throughout the day. That's not the same thing as meal feeding. It affects protein metabolism differently as well. We had them eat three meals, like a small-ish breakfast, a small to moderate breakfast and lunch, and then a good-sized dinner, kind of like how Americans eat. That was the idea. We weighed out every single meal for every single animal for every single day for 11 weeks. You're talking about 330 meals a day that you're weighing out. This was hours of our time every single day. That's why we weren't worried about it getting replicated any time soon. So what we did was we took different sources, like wheat, soy, egg, and whey. These diets are completely isocaloric, completely isonitrogenous. There's no difference. The only different was the protein sources. We were able to show that the animals fed egg and whey actually had higher rates of muscle protein synthesis and actually had better body composition than the animals fed wheat. Now, soy had the same body composition as egg and whey in terms of body fat percentage, but they had way lower muscle mass. Soy is weird. Soy has some weird, funky stuff going on. I think soy is fine in moderation, but I think getting all your protein from soy is a really bad idea. The isoflavones in there, there's some benefits to them, but there's also some downsides, and definitely with regards to muscle mass. Across the board, the heaviest animal in the soy group was not bigger than the smallest animal in every other group. I mean, they were significantly smaller. There's some benefits to blood glucose profiles and all that kind of stuff with soy, because the isoflavones, but in terms of muscle mass, there was definitely a blunting effect of muscle mass on soy. I think some of the isoflavones have been shown to activate AMP kinase, and that can impede muscle protein synthesis, that sort of thing. Wheat had about the same level of muscle mass of egg and whey, but had way more body fat, way more body fat. I think the reason the muscle mass was the same was because all those animals were heavier and they were just having to carry that around every day. If you look at obese people, they have...

**Krissy:** A lot of muscle mass.

**Layne:** ... more than average muscle mass in obese people. That's because they're just carrying around more body weight.

**Krissy:** Body weight training.

**Layne:** Yeah. Exactly. In terms of composition and muscle mass, egg and whey were the best. It seemed to be reflected by the differences in leucine intakes. Now, we also wanted to look at protein distribution. It was funny. As I was getting ready to write this last experiment, Dr. Layman was like, "You know, you talk a lot about protein distribution in your thesis here, and you've never actually tested it, so you probably should test that or take out that wording." Ah, crap. We took the highest quality protein, whey, which whey was consistently the best in every single one of our studies. Even if it wasn't statistically significant, the absolute number was the best. What we did was we either had groups basically eat whey evenly distributed across three meals, so they were getting the same amount of protein across each meal, or at least a level that would trigger muscle protein synthesis, versus low protein at breakfast and lunch and then really high protein at dinner. They were getting about 70% of their protein at dinner and about 15% at breakfast and lunch. Actually, there's data from a guy named Decastro that shows that most Americans eat about 65% of their protein at dinner. It wasn't too far outside that range. Now you're talking about exact same calorie intake, exact same nitrogen intake, only difference is how we distribute it, and we were able to show a difference in muscle mass. Now, it wasn't a huge difference. It was only about 8-10%, but for somebody who's an elite athlete that's a big difference. When people ask me, for example, about something like intermittent fasting, I will say, "I think it's fine for fat loss. The data shows that meal frequency doesn't make a difference in fat loss, but if you're talking about muscle mass, I think it's probably not optimal." That's what we were able to show with these experiments, that not only did the quality of protein make a difference, but the quantity of protein, the quality of protein, and how you distribute that protein makes a difference.

**Nick:** The winner was spread evenly across the three meals?

**Layne:** Yes.

**Krissy:** Yeah. Whey spread evenly.

**Layne:** Now, that being said, this is where context is important. I've had people tell me, "Listen. I am able to be way more adherent to intermittent fasting than any other diet I've ever done. For whatever reason it just works for me." Then fine, do that.

**Krissy:** Then do it.

**Nick:** Set your goals accordingly.

**Layne:** What I'll say is maybe what if we intermittently restrict carbs and fats, because protein doesn't have the same effect. High protein diets, the effects that they have on genes is very similar to actually just fasting to be honest with you. I say, "Well, why not have a couple doses of just protein, only have a shake or something. If your goal is to have more muscle mass, do that. Then you can put your carbs and fats altogether in an intermittent fasting way." There's no reason that shouldn't work well either. It's funny how things don't always... Some of the most interesting stuff in your research is stuff that didn't actually work out. The other thing that we really did to try and kind of bring home--this was in a previous study--the story of leucine, was we took wheat, which is a low leucine protein. It's only about 6.8 to 7% leucine, whereas whey is 11 to 12%. Carbon Build is 13%.

**Krissy:** Hey-oh.

**Layne:** The highest leucine out there, Pipology 101. Just saying, 3.1 grams of leucine per serving. Like I said, there may be another protein that has a higher leucine intake. I'm not aware of it. But we took wheat and we supplemented with free leucine to match the leucine content of whey. We were able to show it was almost exactly the same response. What was interesting was not only is protein important for muscle mass, but also fat loss, because we found that even though wheat had the same muscle mass as egg and whey groups, they had more body fat. We believe that's because they weren't getting that stimulus of muscle protein synthesis, which is ATP dependent, energetically dependent. We think it is actually large portion of the thermogenic effect of protein. We know there's a thermogenic effect of protein, a TEF, that's way more than carbs or fats, but people had always kind of thought it was maybe from digestion or the urea cycle, but it's not, because you get all those ATPs back from the urea cycle. The body's very efficient with that. What it is, is that it activates that feudal cycle of increasing muscle protein synthesis and increasing protein degradation. That use of ATPs is thermogenic. It's really interesting how that works out. We were actually able to show that muscle protein synthesis is so powerful that it actually causes a drop in intramuscular ATP levels, once you trigger it. That in turn actually triggers AMP kinase, which truncates the signal of that muscle protein synthesis. How cool is that? I'm getting super nerdy out there. Krissy's over there like, "Yes. Tell me more."

**Krissy:** Nick's like, "On that note, let's wrap it up."

**Layne:** That actually causes a thermogenic effect, because now AMP kinase activates all these systems that deal with fat loss. Not only is the quality and amount of protein important for muscle mass, but it's also important for fat loss and just overall body composition.

**Nick:** Where you get your protein does matter.

**Layne:** It does matter. Now, I will tell you that before everybody goes out and says they're just going to eat whey for all their meals, you can take a low quality protein source and get the same response if you eat enough of it, if you get to that three gram leucine threshold. The problem becomes your anabolic bang for your caloric buck. Whey is giving you such a powerful anabolic bang for your caloric buck, whereas if you're going to eat something like wheat, you're going to have to get like 50 grams of protein just to hit that three gram threshold.

**Nick:** 50 grams of protein from wheat's going to be some... You might think you have rhabdo at the end. Your farts are going to be...

**Layne:** Think about cereal. You know what I mean? Yeah. Exactly. Again, that's where it's about context. Right? An egg, or chicken, or something like that, some animal source of protein, you can still get as good as whey, but you're going to require more. Again, that's fine, but it's important to think about.

**Nick:** All right. Thanks for coming down here and talking to us about all of this.

**Layne:** Thanks for letting me geek out. I appreciate it.

**Krissy:** I loved it.

**Nick:** Absolutely. You can be found many different places online. Give us a couple of them.

**Layne:** Yeah. My website's the best place to find all things Biolayne, [biolayne.com](http://biolayne.com). Obviously my section on Bodybuilding.com's going to have [all my articles](#). Check out my supplement line, [Carbon by Layne Norton](#), as well as for people looking for nutritional information out there who aren't maybe ready to pay for a coach, my website, [avatarnutrition.com](http://avatarnutrition.com), we're doing some big things to it. By the beginning of the year we're going to have... I can't really say much yet. I believe it's going to have a million members within a few years. It's just going to be that revolutionary for people.

**Nick:** That accessible.

**Layne:** That accessible. For \$10 a month, you're getting customized nutrition recommendations. We're actually taking that way further. If you haven't checked that out yet, go check it out. Play around with it. We're going to have some free stuff coming out in the future. Yeah. I think that that's actually one of the things I'm most excited about in terms of my legacy is a way for people who can't afford a coach, a personal coach, there will always be a place for that, but who can't afford \$10 a month to get customized, science-based nutritional training or nutrition advice?

**Nick Collias:** Great. See you all next time.

**Krissy Kendall, Ph.D.:** All right. Thanks, Layne.

**Layne Norton, Ph.D.:** Thank you guys.



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