Dr. Michael Ormsbee: Food Timing, Nutrition & Supplements for Fat Loss, Muscle Growth & Recovery

Perform with Dr. Andy Galpin · Episode 19 · April 2, 2025 · Transcript

This transcript was generated using speech recognition software and may contain errors. Please review the episode audio before quoting from it.

Dr. Andy Galpin
The science and practice of enhancing human performance for sport, play, and life.

Welcome to Perform.

I'm Dr. Andy Galpin. I'm a professor and scientist and the executive director of the Human Performance Center at Parker University. Today, I'm gonna be talking with my longtime friend, Dr. Mike Ormsbee. Mike is a professor at Florida State University. He is the director of the Institute of Sports Science and Medicine. Mike is a world-renowned expert in all things exercise physiology, supplementation, sports nutrition, and a whole host of other important and interesting topics that we'll get into in today's conversation. Mike has done a tremendous amount of work over the last 15 years, specifically in the area of pre-sleep nutrition, and I could promise you we're gonna get into some things that are Mike's lifelong passion and career that are counterintuitive to what most people think about what to eat and what not to eat prior to sleep. In fact, I'll give you a little bit of a spoiler alert. He has some pretty compelling evidence over multiple studies that eating specific items in specific amounts prior to sleep is advantageous for not only sleep and recovery, but multiple other things as well. The conversation was wide-ranging, but we'll cover many other things like a handful of supplements that people have not heard of that have interesting implications for a wide variety of performance and health-related outcomes. And so it was a fascinating conversation. I learned a lot from it. I've known Mike for a long time. I've known his work for a long time, but there was a lot that I did not know about the work he's done and will be doing in the future. So here we go with Dr. Mike Ormsbee. I hope you enjoy the conversation as much as I did. Dr. Mike Ormsbee, thank you so much for coming out. I know it was a long trip this morning, and I have a bunch of stuff I'm excited to talk to you about, but first, uh, thank you so much for coming out.

Dr. Michael Ormsbee
You're welcome. Welcome. I've, uh, not been able to come over here and do some podcasting and, uh, hang out on this side of the country for a while, so, um, for me, it's a pleasure. I appreciate the offer.

© 2025 Perform Productions LLC

Dr. Andy Galpin
I love your research. Uh, I love a lot of the stuff that you've gotten into, so I-- when we decided to officially have guests for Perform, I was like, "Mike, Mike has gotta be on the list," and stoked to have you out here.

Dr. Michael Ormsbee
Appreciate it. I can't wait to get into some of this stuff because, uh, I, I love it. It's, it's what I do day in and day out, and, um, t- uh, speaking to a bigger audience is a pleasure.

Dr. Andy Galpin
Fantastic, man. We're gonna go to a lot of areas, but where I wanna start is actually with ultra-endurance stuff.

Dr. Michael Ormsbee
Sure.

Dr. Andy Galpin
So you yourself, I know you played hockey, uh, a- and probably plenty of other sports, but then you not only have competed in various forms of ultras, and then you've done a lot of research in that. So, like, tell me how you got into that background and then, and like very specifically some of the studies you've done-

Dr. Michael Ormsbee
Yeah. Yeah, yeah

Dr. Andy Galpin
... uh, with the athletes you work with.

Dr. Michael Ormsbee
So yeah, I played college ice hockey through my junior year at Skidmore College in upstate New York. Um, and then I went to grad school in South Dakota and, uh, coached the Pee Wee B state champs-

Dr. Andy Galpin
Oh, nice

Dr. Michael Ormsbee
... uh, uh, out there , which was a great opportunity to coach, so that was like my, my dip into that a little bit. And then, um, coming back to go to more graduate school, I ended up, um, uh, being at ECU, and they're like-- I saw an email come across and it said, "Anyone ever play hockey before?" And I'm like, "Well, I used to play a lot of hockey." So I remember emailing the coach and just saying, "Hey, we're, we're, uh... I, I'm here. I'm in my PhD program, so I don't know how much I can contribute. Can I come out?" And he's like, "Yep, you gotta be on the

© 2025 Perform Productions LLC

team." So, um, that was a lot of fun. They dropped me off to study all day, picked me up to play a 11:00 PM game. Um, and that was a great season. That was the end of my eligibility.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Ended up playing, uh, two more, or coaching two more years at ECU. But I finished and was like, there's this void with being competitive, and that came out in, for me, in triathlon of all things. And I kinda got into it because of my, uh, master's advisor. I showed up for a, um, an interview basically in South Dakota, and he put me on a bike. I'd never ridden a bike more than three miles, and we went for like a 20 mile, which doesn't sound all that long now, but it was ex- excruciating.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um, and I'm out here trying to ride a bike and keep up, and I thought, um, "If he can leave work and go ride his bike, then I better learn how to ride a bike so that I can go do it with him or get out of here and go, go train a little bit." So that got me into cycling, and then, um, one thing led to another, and I was training for short distance, and then, um, my wife and I sort of got into some of the middle-distance triathlon. Ended up finishing my longest were like these 70.3 half Ironman events. And so that was it. I loved the training. I just, I loved setting it up, figuring out what I need to do to f- to meet all the different goals and demands I had, um, i- in terms of increasing VO2 max or being able to push thresholds or, you know, what kind of pacing that I wanna pull. And then nutrition played a gigantic role in triathlon, which I was, you know, obviously into nutrition, and it's often considered the fourth aspect of triathlon.

Dr. Andy Galpin
Oh, right.

Dr. Michael Ormsbee
And so I got to really put to practice the textbook recommendations that are given, like what is a cleaner sport than being able-- in terms of like following a textbook to a T. So many other sports you can't really do that, and clearly there are curve balls that can come in even with triathlon, but it's pretty specific. Like you know the distance, you know the length. If you can get the temperature, uh, correct, you can pretty much eat according to textbook on these things. So I started making videos about it and trying to post those for my students and, um, travel along with my first half Ironman experience, and those went over really well. Um, and it was just an awesome experience to sort of feel what that was like, and I loved the idea of training and trying

© 2025 Perform Productions LLC

to get better each day and, and competing. Turns out I'm not very good at triathlon. Um, so-

Dr. Andy Galpin
Well, I mean, context here a little bit. If everyone, one was to see your physique, they would probably not picture you as a triathlon kind of guy.

Dr. Michael Ormsbee
Yeah. You know what's funny? And so I lost about 25 pounds training for that. So I normally sit like-

Dr. Andy Galpin
I don't believe 20 of that is muscle probably.

Dr. Michael Ormsbee
I lost so much, but I was like pur- I was like fueling.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
I was doing the creatine, I was doing everything to try to save what I could, and I documented it all. So I actually did okay. But, um, when I was down like getting real low-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... uh, you know, my friends and my wife in particular were like, "Uh, you can't get too skinny on me," so-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... so that, you know, was a change. I was definitely, um-Uh, my body type is not really built for triathlon, but I tried to force it that way for quite a while.

Dr. Andy Galpin
Now, I know that, I'm assuming that led into why you did some of your work in your lab in these endurance, I'll call them ultras and tris and, and things like that. I know you've also done and still coach athletes in, in various-

Dr. Michael Ormsbee
Yeah

© 2025 Perform Productions LLC

Dr. Andy Galpin
... these sports. But before we get to that stuff, do you remember offhand any specific things you did, any food items or amounts or timings or fluids, supplements, anything that you took for your own personal performances that made you feel better?

Dr. Michael Ormsbee
Yeah. So I was targeting 60 grams an hour of carbohydrate, which is pretty typical, um-

Dr. Andy Galpin
Yeah. Typical, but lower probably.

Dr. Michael Ormsbee
Yeah. I didn't wanna go north of 90, 100, where they're starting to go now. Um, I knew I'm not elite enough to perhaps do it. I didn't also have the stomach training to handle it, um, and it wasn't a priority for me at the time. I wanted to do textbook so I could show my students, "Here's a textbook."

Dr. Andy Galpin
I gotcha.

Dr. Michael Ormsbee
"Here's what we're doing." So it was 60 grams an hour, um, and that, that was fine. So I was, I was doing that with, like, Goos and Gu Octanes. They're usually 30 grams. I was taking two of those an hour.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Um, then I had fluids on the bike, and I used, uh, a product at the time that had protein in it as well, not for anything other than maybe help save a little muscle over these prolonged periods of, of training. So those were some common things that I was, uh, doing over that time.

Dr. Andy Galpin
Today's episode is sponsored by LMNT. LMNT is an electrolyte drink mix that has an ideal electrolyte ratio of sodium, potassium, and magnesium, but no sugar. Hydration is critical to performance, both physical and mental performance. Countless studies have shown that even a slight degree of dehydration, even as small as 1%, can lead to decreases in physical output and mental performance. We also know that electrolytes are critical to proper hydration, which I've been harping on for years. But you can't do that, proper hydration, by only drinking water. You need to get the right amount of electrolytes in the right ratios, and that's why I'm a huge fan of LMNT. In fact, many of you will probably remember that I featured LMNT in my YouTube series

© 2025 Perform Productions LLC

on optimizing hydration nearly five years ago. I featured LMNT in these videos because their blend of 1,000 milligrams of sodium, 200 milligrams potassium, and 60 milligrams of magnesium really is unique and different than any other electrolyte on the market, and it has great scientific support. I use LMNT constantly, particularly when I'm sweating a lot, and I routinely make it a part of my clients' optimization programs. If you'd like to try LMNT, you can go to drinkLMNT.com/perform to claim a free LMNT sample pack with the purchase of any LMNT drink mix. Again, that's drinkLMNT.com/perform to claim a free sample pack. Today's episode is also sponsored by Eight Sleep. Eight Sleep makes smart mattress covers with cooling, heating, sleep tracking, and more. I've personally been sleeping on an Eight Sleep mattress cover for years now, and it's absolutely glorious. I love it so much that I hate traveling away from home because it means I can't sleep on my Eight Sleep Pod 4 Ultra. As you'll hear me talk about endlessly on this podcast, there really is nothing you can do that makes more of an impact on your health and performance than getting tremendous sleep. And getting great sleep requires having your body temperature drop a couple of degrees at night, and that's hard to do on your own. The Eight Sleep has been a game changer for me because I run hot at night, or as my wife calls it, I'm a furnace. If I don't have something like an Eight Sleep helping me cool down, I'll wake up in the middle of the night overheating and not feeling great. This is something I've also found in many of the people that I coach, especially those who are really physically active. The Eight Sleep Pod 4 Ultra has two times more cooling power, yet is virtually silent, and it has high-fidelity sleep tracking and even has snoring detection that'll automatically lift your head a few degrees to improve airflow and stop your snoring. If you'd like to try Eight Sleep, go to eightsleep.com/perform to save $350 off your Pod 4 Ultra. Eight Sleep currently ships to the US, Canada, the UK, select countries in the EU, and even Australia. Again, that's eightsleep.com/perform. I wanna, uh, transition from there and talk about one of the areas you're probably most famous for, and that is nutrition prior to sleep. And I... I- it has stunned me that despite you talking about this and working in this area for 15-plus years-

Dr. Michael Ormsbee
Yep

Dr. Andy Galpin
... I don't know how many publications you have on this, but it's, it's not a small amount, and very few people have either heard this or put it into practice.

I'm really shocked because of how effective, how well-rounded, uh, this has been shown, how many different populations you've done this with. And again, people somehow completely either don't talk about it or they give the exact opposite advice.

So on the spot right now, tell me exactly what I should be eating prior to bed.

© 2025 Perform Productions LLC

And I'm being a little bit facetious there, so take this-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... where you want.

Dr. Michael Ormsbee
No, I tell you-

Dr. Andy Galpin
This is your area

Dr. Michael Ormsbee
... 40-- at this moment, 40 grams of a protein-dominant food that's less than 220 calories.

Dr. Andy Galpin
Okay. So what you're suggesting is about, uh, most of your studies have been 30 minutes, right? So 30 minutes prior to going to sleep, 40-gram bolus, and why on earth would I do that?

Dr. Michael Ormsbee
Yeah. So let me tell you a story.

Dr. Andy Galpin
And how does it not hurt my sleep?

Dr. Michael Ormsbee
Okay. So we'll get into all that, but let me f-first tell you the background on some of this. So stemming from those Ultraman studies and our sleep was sort of linked into this. So, um, if anyone can remember those old shows were giant weight loss shows on television that existed for a long time, the, the, the TV talking-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... heads would always say, "Stop eating. There's a cutoff time. There's a cutoff time." And I remember being a grad student at the time, or even an undergrad at the time, and thinking, "Well, everybody I know eats at night, and they're all very much fit and in shape and have no problem." And so this, this dichotomy is going on. I'm thinking, "I don't know. I've, I've, I've never seen a paper on it. I'd love to see that," and started looking at it a little bit here and there, and then finally, you know, when I h- was independent, um, investigator, was, started on, on that path.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Was this your first study that you did?

Dr. Michael Ormsbee
First one at Florida State.

Dr. Andy Galpin
At your lab?

Dr. Michael Ormsbee
Yeah. First one in my own lab at Florida State. We th- we got some small, um, funding for it, and we decided, uh, let's see what happens, and then 15 years later, we're, we're designing two new ones right now. So-

Dr. Andy Galpin
Okay

Dr. Michael Ormsbee
... let me, let me take you on that story. So-

Dr. Andy Galpin
Please.

Dr. Michael Ormsbee
Yeah. So, uh, th-that was going on. People were saying, "Don't eat at this time. Don't eat." I'm thinking, "I don't know. There's, uh... I know a lot of people..." Plus, in like the bodybuilding circle, the figure world, people would purposefully eat at night, or they would purposely, if they had to wake up to, like, use the bathroom, they'd have a protein shake sitting right there in the bathroom.

Dr. Andy Galpin
I remember many days-

Dr. Michael Ormsbee
Yes

Dr. Andy Galpin
... of having pre-made protein shakes in the bathroom, so not only if you woke up, but I remember setting an alarm to make sure-

Dr. Michael Ormsbee
Yeah

© 2025 Perform Productions LLC

Dr. Andy Galpin
... that I woke up, smashed the protein shake, and went back. And people constantly did this.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
This was a, a very common thing.

Dr. Michael Ormsbee
It was, it was super common. So there was just these different worlds, and so clearly there were like, "We gotta start somewhere. What, what's happening here?" So we started looking through the literature, and this was about 2010. Um, and there was really nothing that existed in the way that we're thinking about pre-sleep feeding and what to eat b-before bed. There was some data in large mixed meals, like having your full-on dinner before bed, late at night, that weren't very good. So, uh, 1993, Roman did a study where I remember they gave 544 calories, and they gave you this in the morning, in the afternoon, or in the evening. And they just measured your metabolic response to the meal. And it was, it was just a stairstep. So if you had it in the morning, you had the best response. In the, in the, in the middle of the day, you had a medium response. If you had it at night, you had a very low metabolic response to that meal.

Dr. Andy Galpin
So perhaps those that are a little bit less versed in science would be taking that study and saying, "Okay, therefore, you'll be better metabolically by having your calories earlier in the day."

Dr. Michael Ormsbee
Exactly. Yeah. And in-

Dr. Andy Galpin
More to the story, but-

Dr. Michael Ormsbee
And in reverse, they'd say, "If you had your calories at night, you're gonna get fat."

Dr. Andy Galpin
Bingo.

Dr. Michael Ormsbee
"You're gonna gain weight."

Dr. Andy Galpin
So this is where that whole story started.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
That's where it all started.

Dr. Andy Galpin
It's from that paper.

Dr. Michael Ormsbee
1993. And then several other things have happened along the way. Um, there was a study in 2004 from De Castro, and that looked at, like, when do you feel the hungriest, and when do you eat the biggest meal? And they're always in the evening. Um, and so all the data were lining up that you're hungriest at that time, your, uh, ability to, like, control your caloric intake is worse at that time. And so-

Dr. Andy Galpin
So you'll be less metabolically healthy. You'll make worse choices. You'll probably overeat.

Dr. Michael Ormsbee
And so everyone says-

Dr. Andy Galpin
Stay away from it. Stay away from it

Dr. Michael Ormsbee
... you're gonna have a tr- you're gonna have trouble. So, but, you know, I'm thinking of a protein shake, right? And that's how we started. We started giving-

Dr. Andy Galpin
This is why meatheads need to be in science.

Dr. Michael Ormsbee
It's... Every time.

Dr. Andy Galpin
This is just, this is a meathead thing.

Dr. Michael Ormsbee
It, it really is.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And it's like w- co-common sense is like, "Well, I don't need 600 calories. I just want a protein shake. What is that gonna do?" Or scrambled eggs, or whatever it was that I was eating just

© 2025 Perform Productions LLC

naturally at that time. So we designed, designed a couple of studies at the, at that time, um, very simple. Great, simple design, simple answer. I give you a few options to drink before bed, uh, uh, like a whey shake, a casein shake, a, at 30 grams apiece, or a carbohydrate, or a placebo. And they all taste the same. They're blinded. Um, and so you go home, you take this, you come back to me in the morning, and I measure your resting metabolic rate. That's it. I see how your metabolism may or may not change some eight hours later. And so you come back in the morning, and if you had nothing, so like the placebo, which was no calories, you had a, a response where your RQ was kind of low, so you're burning more fat at that period of time, as you would.

Dr. Andy Galpin
So not that you're burning more or less calories, but the percentage of your calories coming from fat-

Dr. Michael Ormsbee
Correct

Dr. Andy Galpin
... versus carbohydrates.

Dr. Michael Ormsbee
Exactly. And that-

Dr. Andy Galpin
That's RQ, RER, same, same thing.

Dr. Michael Ormsbee
And that was no difference from the casein drink. So in both cases, with, with... in the first studies, um, if you had either nothing or you had casein, you still had quite a nice ability to burn a big percentage of fat the next morning. And then when we gave the whey, that was pretty close, but not quite there in terms of how low or the RQ was, how, how good the fat burning was, and then carbohydrate was a little bit worse than that. Um, but nothing was bad, and everything seemed to show an improvement over having no calories at all in terms of the total metabolic rate the next morning. But so many holes in that, right? So-

Dr. Andy Galpin
Sure. Sure. Sure

Dr. Michael Ormsbee
... we got hammered from reviewers. I remember, "Oh, I'm so proud of this," and then it came back.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah, yeah, yeah.

Dr. Michael Ormsbee
It's like, "Well, you didn't do this, this, this, this."

Dr. Andy Galpin
As you were saying that, I was in my head going, "I, I, yeah, okay. I-"

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
"I'm gonna ask... Okay, okay, okay."

Dr. Michael Ormsbee
So many problems.

Dr. Andy Galpin
"Okay, I got the comment section. I got you guys." Yeah.

Dr. Michael Ormsbee
And so what we just-

Dr. Andy Galpin
First study, first lab.

Dr. Michael Ormsbee
It was the first one.

Dr. Andy Galpin
Very first one, guys.

Dr. Michael Ormsbee
And we wanted to see how that reacted, and that was in, um, that was in sort of young men.

Then we looked at this in different populations. So we started to go to different populations. We started to look at, um, overweight women and then, um, some women with obesity, and we repeated the study and had very similar outcomes. So casein and whey being quite favorable for metabolic rate in the morning. Um, what the problem we had was we hadn't introduced exercise yet, so we didn't know what that was doing. And we have no idea what you're, what's happening from leaving my lab with a shake in your hand to coming back to me the next morning. So over a series of more studies, we designed, uh, I don't know, 15 more after that along the way, where we ended up, um, putting mattresses in the lab and having people sleep there so that we could

© 2025 Perform Productions LLC

just monitor everything. We ended up thinking about, um, uh, exercise in a way that was useful. So one of those studies in ob- p- with women with obesity in the beginning, they had actually a rise in glucose and insulin, um, from having the, the shake before bed when we measured it the next mornings, and that's not a good thing. You don't want that to be. So we decided to introduce exercise minimally. Uh, I think it was two days a week we put in, and we just did it for four weeks. But when we did even just a little bit of exercise with people who didn't usually do it, all of those negative things went away entirely. It just shows you how powerful exercise driving all of this stuff, um, over the nutrition. I mean, any day, that exercise base is going to be the main mover of the physiological needle, and the nutrition really just helps push it one way or the other. Um-The other thing we didn't, uh, do well was that if you're sleeping at home or sleeping in the lab, um, how do I know how-- if that's like your usual way of sleeping, and does that influence fat metabolism? So I remember a reviewer said, "Did you measure sleep?" I'm like, "Never even crossed my mind." And I'm doing sleep, I'm doing pre-sleep studies. So at that time, we just implemented like a survey. So you come in and we say-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... "Okay, how, how much, uh, you know, how much did you sleep last night? Was it good or bad or usual?" And then in that simple measure, we saw no differences. And then we brought them into the laboratory, and we're like, "Oh, well, surely that's not gonna be great for sleep. It's a different environment," and all these things. And we made it, again, pen and paper, no difference in what we're finding in terms of just asking them that question. Um, so then we now-- I'll, I'll fast-forward to kind of what we're getting to in, in a few minutes, but now we're purposefully designing for an outcome of sleep, where we've never done that before. We've always measured it for recovery. We've measured it for metabolism, not for the outcome of sleep as our primary aim. But we'll talk about that in a second. Um, one of the things that I think really helps us now is that we introduced in some of our studies a technique called microdialysis. Now, that's something that I learned in grad school from, uh, a guy named Professor Bob Hickner, great friend, excellent researcher, my mentor, uh, just a phenomenal human.

Dr. Andy Galpin
I, I visited his lab a couple of times a long time ago, but did a ton, a ton of great work over the years, so.

Dr. Michael Ormsbee
Yeah, consistently just excellent work.

© 2025 Perform Productions LLC

Dr. Andy Galpin
And you eventually drug him down to hang out with you in Florida State.

Dr. Michael Ormsbee
I did, yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
That's a whole 'nother story. It's, uh, but it's fantastic because I have like the godfather of microdialysis-

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... in our backyard, and it's, it's great, and that's a technique I learned in my PhD program as well. So we started implementing this microdialysis-

Dr. Andy Galpin
Just walk us through what that is really quickly.

Dr. Michael Ormsbee
Yeah, so-

Dr. Andy Galpin
It's exactly what it sounds like, but expand.

Dr. Michael Ormsbee
Yeah, it is, but yeah, I guess it's a little complicated. So imagine like, um, getting your belly pierced. So when we originally started this, it was you pinch a roll of fat in your sub, your subcutaneous fat on your, on your belly, and then you'd put a small needle through and then pull it out the other side, and it's threaded with, um, a tiny probe, a flexible membrane that you can slide underneath the skin. So then the needle's out entirely. You just leave this little flexible tubing under the skin. Um, luckily now they make these as concentric probes, so it's only-

Dr. Andy Galpin
Ah

Dr. Michael Ormsbee
... one poke instead of two.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
So you'd only have to pinch and put one, um, poke in there. And then what happens is there's an inlet tube and an outlet tube, tiny little micro tubes. Um, and then you can say, you can perfuse all kinds of stuff, but we perfuse saline, and saline goes into the interstitial space and mixes around and then comes out the outlet tube. So what I measure should be saline plus whatever's coming out of the cells around the probe. Um, and so we measure in that probe real time, um, all kinds of stuff, but traditionally glycerol is the primary marker we're looking at for fat metabolism, so specifically lipolysis.

Dr. Andy Galpin
Right. So what you're doing is you're putting a small needle in somebody's belly fat-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... so you can measure exactly how much fat is being burned, right?

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
The, the other way to do it is you collect the gases that they're breathing out of their mouth.

Dr. Michael Ormsbee
Yeah, but that's-

Dr. Andy Galpin
But that's only g-

Dr. Michael Ormsbee
... slightly different, but slightly different. So the oxidation piece is a little bit different. We're looking specifically at lipolysis. We have no idea if it's actually being burned. It's just being s- liberated from the cell.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
And so we'll pick that up in the probe, and we have to measure that. So, um, adipocytes lack the enzyme glycerol kinase, and so glycerol can't go back into the adipocyte.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
And so it is a little more stable than measuring free fatty acids, for example, because they can s- a little more readily go in and out of the fat cell in certain conditions. Um, so glycerol is the main marker-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... of lipolysis.

Dr. Andy Galpin
Just really quickly, what does glycerol have to do with fat?

Dr. Michael Ormsbee
Right. So you've heard of a triglyceride. Everybody's probably heard of that. So the backbone of, uh, of a triglyceride, tri being three, are f- three fatty acids attached to a glycerol. And so that's liberated through hormone-sensitive lipase as the adipocyte is, um, stimulated to release fat, and that can be from all kinds of stuff, but exercise is typically what we, we use to drive that. And then you'll, they'll all be liberated from the cell, and eventually glycerol will be also put into the interstitial space, and ultimately we can pick that up in the microdialysis, um, dialysate that we collect.

Dr. Andy Galpin
Right. So what, what you're able to look at is directly from the tissue, whereas if you're on a metabolic cart and measuring gases, it still sounds and feels like you're measuring fat burning, but as you said earlier, you're not.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
One is measuring the entire body and how much actual carbon dioxide you're breathing out, and what you're measuring directly is how much, and if you're not familiar with this, is lipolysis. This is the breakdown of fat. And you mentioned this quickly, but really making sure folks don't miss it, fat burning and fat loss and fat oxidation are not necessarily the same thing. They sound similar. This is where we can get lost in science a little bit. But it's really important if you're gonna make a claim about what happens to somebody's fat burning with, in your case, what you eat before bed,

© 2025 Perform Productions LLC

measuring directly in the tissue itself is gonna give you a significantly different answer than measuring-

Dr. Michael Ormsbee
Right

Dr. Andy Galpin
... resting metabolic rate or on a cart or something like that.

Dr. Michael Ormsbee
Yeah, and what's, what's nice about this technique is that we're describing it in the abdominal fat-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... tissue.

Dr. Andy Galpin
It's where people care.

Dr. Michael Ormsbee
But we also can do it right now, like we're running a study where we're looking at the abdominal and we're also looking at the gluteal, and men and women s- have different amounts of fat in those areas, and it all has to do with the receptor type that's on the adipocyte in that space. And so we have like these beta and these alpha receptors that primarily drive what's going on in these different spaces, and so you and I will have a different concentration of the alpha and beta receptors on the adipocyte in our abdomens versus our hips and, and top of our buttocks, right? And so women will also have a different profile. Um, and that also changes to, like for example, the perimenopause, menopause transition. Um, a lot of those things are, are, are really interesting for people to know, like what's going on in these different tissues? Uh, can we fix it? And then we can also put drugs through the probe if we need to, and we can stimulate or inhibit those receptors and figure out mechanistically what's going on in the different tissues. Um, but for our pre-sleep feeding studies, we weren'tperfusing any drugs.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
It was just simply looking at what was going on with lipolysis. And then we would measure oxidation with the breath samples-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Right

Dr. Michael Ormsbee
... as well.

Dr. Andy Galpin
There you go.

Dr. Michael Ormsbee
So you have to do both. Um, but it gives you a better picture of exactly what's happening. Um, so we finally had this tool to measure glycerol, so lipolysis overnight. And I remember my doctoral student at the time, um, Amber Kinsey, was my first doc student running this pr- this study, and I remember she came in and she's like, "Oh my goodness, um, nothing happened." Like we, like we, we didn't see any difference in lipolysis, no matter if they took carbohydrate, protein, placebo, whatever we gave. And, uh, I, I did, I thought we'd see something. And I remember going through the data and we're like, "You know what this means?

You can have something before bed-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... and it does not change lipolysis." So you don't have to worry about the fat metabolism piece of this with a small, uh, calorically small meal or, or a protein shake in a protein-dominant situation.

Dr. Andy Galpin
So to tie that together, if the 1993 paper held true,

and the follow-up paper held true, and eating before bed was going to make you fatter, what you should have saw in your study is you should have saw the rate of lipolysis go down.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
You should have seen less fat burning, we're gonna-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... refer to it like that. But when you saw that it didn't go down, it stayed the same, this is actually

© 2025 Perform Productions LLC

the powerful conclusion that that meal you had before bed did not make you fatter and did not at all alter your fat burning either ability overall or the rate at which you're doing it.

Dr. Michael Ormsbee
Correct.

Dr. Andy Galpin
I have had that scenario with totally different topics multiple times in my lab with my students where they come in freaking out, "My thesis didn't work. My dissertation failed."

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
And you have to really step back and say, "What is the data telling me?" In your particular case, it was potentially, and one would argue, more powerful the fact that it wasn't different.

Dr. Michael Ormsbee
Yeah, and I agree. It's, it's really hard in, uh, uh, doing research in this space because

everybody wants to find the magic pill or potion or situation, and there are very few studies where we find some kind of amazing claim that comes out of it. Almost every time we're saying, "No, that didn't work, and that didn't work either. That didn't work either." Um, and it's really... It's a fun process to be on. The beautiful thing is that that's equally as important in our field for people to know that. Um, there are some fields where sort of quote negative data would be a big problem.

Dr. Andy Galpin
Oh, yeah.

Dr. Michael Ormsbee
But, uh, that's not the case here because it's really important people know if something works or doesn't and d- and depending on what outcome you're looking at.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Um, let me go back to a little bit of the pre-sleep protein story. So we were o- one of two labs doing this work from the early stages. So the other lab was Luke Van Loon's lab-

Dr. Andy Galpin
Oh, sure

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... in Maastricht University, and their work is fantastic. And so around-

Dr. Andy Galpin
Protein synthesis guy, big time

Dr. Michael Ormsbee
... all protein synthesis. So what Luke's group was doing was looking at pre-sleep feeding all from a muscle protein synthesis perspective, where we're looking at it more from a fat oxidation, fat mobilization, applied outcomes perspective. And so it was really fun. Several times I've teamed up with Luke to give, um, talks at different conferences and things where we cover all aspects of this pre-sleep feeding. We probably due for a new one at some point. A lot of new data have come out. For, but for about 10 years, we were the only ones doing that work. Now, it's like every week I find a new paper on the topic-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... which is really exciting. It's ex- it's, um, rapidly expanding our knowledge base.

Dr. Andy Galpin
Well, I hope they're all citing your papers every time.

Dr. Michael Ormsbee
They, they, they prefer the muscle protein synthesis ones for sure, but-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... it's really good work. And what Luke found out was that w- uh, for a while, we didn't even know if you could have muscle protein synthesis-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... at that period of time. No one had ever done it. Um, so he was giving young men and older men protein boluses, and then they were doing, uh, lines and biopsies through the night and then the next morning and things. And, um, one of those had like nasogastric feeding to get the protein in that way in these older individuals. So study after study after study showed, okay, yeah, you can feed at that point and have an increase in muscle protein synthesis. And their

© 2025 Perform Productions LLC

studies are awesome, and they did so much good work over the time. And so mixed with our data, it looks like we're in a place where it's either not gonna do anything, pre-sleep feeding, or you could have an improvement in muscle protein synthesis and perhaps recovery in some of these other areas, and maybe a change in metabolism that would be beneficial for some people. Um, at the very least, you're creating an opportunity to meet your total daily protein goals.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
And almost every paper in the last six years that we've written ends with that. It's probably most important as a feeding opportunity simply to he- hit your protein targets for the day.

Secondarily, and it's probably a big secondarily, is it could specifically be useful at that time of day, but it's primarily driven by total protein intake for the day.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, m- minor benefits may come from it. The best example of that's from Luke's lab, uh, Snyder's study. Um, and they actually did 12 weeks of training with the pre-sleep feeding protocol, and the... They had carbohydrates and protein in a, in a shake. And they did this for 12 weeks, and they actually had functional outcomes. So not just MPS, where you're not sure if muscle will actually grow.

Dr. Andy Galpin
Yeah. Instead of just looking at muscle protein synthesis, they-

Dr. Michael Ormsbee
Yeah, not just a marker. We're looking at the actual outcome. And-

Dr. Andy Galpin
Did you actually get bigger muscle?

Dr. Michael Ormsbee
And they found improvements in CS, cross-sectional area. They found improvements in strength, like 1RM. Um, all things people would be interested in simply by having a, a pre-sleep shake. Um, the interesting part was that study was criticized because there were different total amounts of protein taken between the groups.

Dr. Andy Galpin
Mm.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
And so the group who had pre-sleep protein had 1.9 grams per kg, and the group who had, uh, didn't take the pre-sleep protein had 1.3 grams, uh, per kg. So there was a difference. Now, both north of the recommended 0.8-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... grams per kg. Um, and they were criticized for it, but their con- their, you know, the way they thought about it was, "No, no, it's just a feeding opportunity. Take it."

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
"You're at home. You have a- access to these foods. You don't have to be afraid of it." Um, and in our- in their hands, it worked, increasing the total daily protein intake. You digested it, you absorbed it, and you actually laid on muscle with it.

Dr. Andy Galpin
So you said quickly a second ago 0.8 grams per kg is the recommended.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
It-- you mean as in what you recommend or in-

Dr. Michael Ormsbee
No, no, no. No. Uh-

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
So clear, clarify please.

Dr. Michael Ormsbee
Yeah. So RDA, the recommended, um, allowance is, is 0.8 grams per kg to start to stave off issues that can come from lack of protein. Um, and so that number, you know, it's pretty

© 2025 Perform Productions LLC

contested by people who work in this space, although it keeps coming up because it is a number that probably will stave off problems.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, we typically... I mean, there's so much data on here. I'm sure you'll have speakers directly in this area, but it's, it's, it's just incredible. Like, we usually recommend up to a gram per pound or 2.2 grams per kg. Most people don't hit it, and they land right at 1.6, 1.7, which is right where I want them.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um, and so that number works for us. We've had success with that s- in our v-various other protein feeding studies. But, um, there's a tangent I'd love to get on if we want to. Uh, so we, we've done a lot of protein feeding studies with people with, uh, obesity. One of the ones that I thought was very interesting, and I think your, your audience will like it too, the...

We, we were looking at morbidly obese individuals going for bariatric surgery.

So when they show up at the bariatric center, instead of going in and getting the consult and getting the surgery scheduled, they find our team of researchers in the front door.

You know how many people wanted to join us? Not many. Not many. But some said they'd try. And so we had a few subjects trickle in over time that would give us a try. So the, uh, recommended, um, intake, calorie intake on a, on a medically prescribed bariatric diet is extremely low.

Dr. Andy Galpin
They're rough.

Dr. Michael Ormsbee
Very, very low. And now, uh-

Dr. Andy Galpin
It's usually, what, 1,000 calories? Is that-

Dr. Michael Ormsbee
Yeah. At the time we did this-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Eight hundred?

Dr. Michael Ormsbee
... it was 800 calories.

Dr. Andy Galpin
Eight hundred.

Dr. Michael Ormsbee
And it was-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... primarily liquid, but there were some options. Now, this was a few years ago, so maybe it's different now. I haven't looked at it lately.

What we did is we took these individuals and we put them into two groups. Um, we actually put in the IRB that we didn't think it was ethically responsible to not give both groups more protein.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
So we did, and they approved that. So both groups got an added protein bowl, so it bumped them up to almost 1,300 calories, roughly.

One of those groups got resistance training.

Dr. Andy Galpin
Ah.

Dr. Michael Ormsbee
One of them had standard of care, and the standard of care was some directions on a piece of paper, or you can come in here, move some tables around, do some calisthenics type exercise. If you did 12 weeks of resistance training, and this was run by Eddie Joe, who's a professor now, and his, um, his major professor was Dr.-

Dr. Andy Galpin
Oh, was this his dissertation?

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yeah. Yeah, y- yeah. And, uh-

Dr. Andy Galpin
Yeah, he's-

Dr. Michael Ormsbee
His mentor was-

Dr. Andy Galpin
He's a Cal State Fullerton guy. He was

Dr. Michael Ormsbee
... was Dr. Kim, and Dr. Kim is a, a phenomenal man who just recently passed away. And his... They designed this whole deal, and we were giving them more protein. And what was astonishing, uh, was that before the study began, if you did off grams per kg, which how much protein they took in-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... they were down, like, 0.3-

Dr. Andy Galpin
Four, yeah. Yeah

Dr. Michael Ormsbee
... 0.4 grams per kg-

Dr. Andy Galpin
Totally

Dr. Michael Ormsbee
... 'cause their body weight is just a lot larger.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um, after the study, both groups over 12 weeks lost a ton of weight, as you would imagine, not eating much.

Dr. Andy Galpin
Mm-hmm.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
But if you added resistance training, the amount of, uh, a- according to DEXA, the amount of muscle or lean mass that you lost, so there's some issues with that-

Dr. Andy Galpin
Yeah, yeah, yeah. We'll just call it same thing for now. Yeah

Dr. Michael Ormsbee
... was 25% if you didn't train, and was only 4% if you did resistance train. So-

Dr. Andy Galpin
So translation, the group that didn't lift?

Dr. Michael Ormsbee
If you didn't lift, you lost a ton of muscle.

And-

Dr. Andy Galpin
And if you did, you lost almost-

Dr. Michael Ormsbee
Almost nothing. Four, 4%. You're gonna lose some anyway on that kind of a diet.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And-

Dr. Andy Galpin
Variability like-

Dr. Michael Ormsbee
You just think about, like, weight recidivism and the, the people who are probably gonna struggle with this, and now you're at a place with lower lean mass, and you still have trouble with these things, and you're still working on being taught the right things to eat in this process. So to me, that was a fabulous study that really showed the powerful, uh, impact that resistance training w-with protein can have. Um, yeah.

Dr. Andy Galpin
You will see regularly

strength training for folks that are trying to lose weight and to keep it off for a long time. So you said, uh, like retention, recidivism of, of that body composition.

© 2025 Perform Productions LLC

You can't make a strong argument that strength training burns a ton of calories. Uh, we, we were talking about that before we started going. Like, that's not your way to go. One could even argue then, or people have used that argument then as a fodder to say that, "Hey, exercise doesn't help you lose weight." Completely ridiculous, of course. But from a strictly caloric expenditure perspective, it's not very high. However, if you look at that side of the equation, who holds more muscle mass? And then because of that, the associations between strength training and successful long-term and permanent weight loss is really, really high. And we've seen this from a bunch of different lines of research. That paper specifically, I think, just absolutely crushed that conversation. If you wanna lose weight and keep it off, strength training is a very, very, very good idea if you want that to last for a long time. Not gonna be the thing that burns you your calories right now-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... but it's the thing that is gonna arguably lead to longer, uh, term success.

Dr. Michael Ormsbee
Yeah. I think if, if, if, if you skip that part of a weight maintenance or even a weight loss program, it's just not setting you up for the ideal-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... ideal outcomes long term. But it is, it is hard because you, you do... Like, if you're going out for a walk or a jog or a bike, like, you sweat, and then you feel like maybe you're doing more work. And so then you get in your mind about maybe this is better for me f-

Dr. Andy Galpin
Right

Dr. Michael Ormsbee
... for my goals. And it's, it's hard. I think you have to be disciplined i-in many ways, but to follow a program where you're training and maybe not as sweaty as you might be from doing, you know-

Dr. Andy Galpin
Yeah, yeah

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... a, a run or even a walk outside or something. So yeah, I feel like in our, in ourenvironment now, we need to be probably medically prescribing resistance training at the root of all this, and that's just not happening yet in most places. I know some folks are, but, um, I think that's the next step that's gonna have to be taken.

Dr. Andy Galpin
Today's episode is sponsored by Momentous. Momentous makes the highest quality supplements on the market, period. Many of you know me, and you know that I do not trust the vast majority of supplement companies, and for good reason. Many studies have shown that anywhere between 10 to up to 40% of supplements have accidental contaminants, intentional alterations, mislabeling, or other serious issues. But Momentous is different. I literally spent years vetting the company, their products, and leadership team before personally officially partnering with them in 2023. Every single one of Momentous's products is third-party tested to ensure quality, and many are even NSF certified for sport. Now, while I love all of their products, the ones I use the most, both personally and with my clients, are what I call the big three, and these are the omega-3 fish oil, creatine, and newly improved whey protein formula. These three supplements have fantastic data supporting their benefits. Whey protein for lean muscle mass, omega-3s for brain health, and creatine for both muscle and brain support. And they have been shown to be very safe across basically all populations of people: young, old, men, women, et cetera. Now, nobody has to use supplements, and I hope you never feel pressured to do so. But if you're interested in supplements, it's important that you get them from the highest quality providers. You don't want mercury in your fish oil or lead in your whey protein or anything like that. So that's why I stick exclusively to Momentous. If you'd like to give Momentous a try, go to livemomentous.com/perform to get 20% off your order. Again, that's livemomentous.com/perform to get 20% off.

One of the things that is tough for folks not in science to understand often is how is the same response going from kind of low to medium not the same as going from medium to high or high to ultra-high and things like that? Like, we see that physiologically consistently. So you're mentioning, uh, I, I think Luke's study had a couple of different groups, and neither one of them are what we would call maxed out on their protein. So neither one was at 2.2 grams per kilogram, which is what you said you personally recommend, right?

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
So

© 2025 Perform Productions LLC

what's important to understand,

if you take somebody who's probably on a more traditional protein diet, 0.4, 0.5 maybe, and you increase that person to one,

is that gonna be the same response if you take somebody who's at 2.2 already and take them to 2.5?

Dr. Michael Ormsbee
No, definitely not. Yeah, y- y- that... When you're under a certain threshold-

Dr. Andy Galpin
In this case, protein requirements, right?

Dr. Michael Ormsbee
Yeah, for protein requirements. You're gonna be-- Y- you just have so

many wins to catch by getting up-

Dr. Andy Galpin
Right

Dr. Michael Ormsbee
... to a number that's north of 1.1, 1.2. Um, and honestly, that's really hard for some folks, so we have to be easy on ourselves if you fall in that category, like really work at trying to fit these foods into your, into your daily practice. And I get it, if you're busy, you got kids, you got jobs, you got things to... going on, like that takes some planning, and that's a little bit of a headache at first, but it's worth it. Like the, they say the juice is worth the squeeze-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... because they're, the outcomes are just really, really nice. I mean, we've done so many studies in, in my lab or in collaboration a lot with Paul Arciero-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... who's done a ton of this kind of work.

Dr. Andy Galpin
Mm-hmm.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
We, we've shown time and time again that the higher protein loads help a lot with all of these goals we're talking about, particularly weight management, um, on that side of it. I mean, uh, Stefan Pasiakos did a study years ago that was the RDA 0.8 or double at 1.6 or triple.

Dr. Andy Galpin
Mm-hmm. Mm-hmm.

Dr. Michael Ormsbee
Right? And so when they did that, what was really nice to see was that double was far better for the outcomes that they were looking at in that paper, but three times was not. And they landed on double, which is 1.6, and so that's kind of where we're landing with this. We've done work in our space where we did 40% of the diet as protein, and then we've done, um, um, some that we looked at 25, and 25 and 40 weren't all that much different from each other. Um, although I do think I've listened enough to, like, Don Layman and these guys. I don't know that protein should be a percentage. It should probably always be a grams per kg and then just set that as your anchor for your meal planning and then work around it.

Dr. Andy Galpin
Yeah. Figure out your fueling of your carbohydrates and your-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... fat based on how many calories you need, but keep the total amount of protein there as, as close as you can.

Dr. Michael Ormsbee
Yeah. Yeah.

Dr. Andy Galpin
So when you, when we, when we kind of come back to the end of the where we're at now, 15 years of research on protein

or, well, all nutrients prior to sleep, pre-sleep feeding-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... when we look at what Luke's group has shown collectively and what your group has shown,

let me see if I can summarize this-

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... and correct me.

Uh, potentially a benefit to muscle protein synthesis, which would potentially increase actual muscle growth, actual muscle strength. Now, that's probably gonna have the biggest impact if your protein intake is moderate to low.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Right? And this is where going from 0.4, 0.5 up to 1.2 or 1.5, we're getting closer to 1.6,

and Luke and y- and yourself have said this is-- all we're doing here is there's nothing magic, there's nothing special, there's no growth hormone release. We're-- It's not a testot- It's just the fact that you're getting another opportunity-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... to eat and hit your protein mark.

Dr. Michael Ormsbee
Yeah. No doubt.

Dr. Andy Galpin
If you're already at those markers, though, you're already at one gram per pound or 2.2, then that pre-sleep additional protein may or probably won't add any additional to just Luke's side, the muscle protein.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Did I summarize that?

Dr. Michael Ormsbee
Yeah. That's probably where we are at the state of it, and I would say that's the first third of the, of the story.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah. Great. So let's finish that, Luke, and we'll talk muscle growth sort of later. Your, your area is, is more interesting to me right now, which is in addition to that, though, you can do that while not compromising... fat burning. So you're gonna potentially gain some muscle there, and then you're not going to there. So I have a handful of questions here. Specifically, I wanna get into details. What type of protein? Uh, what other stuff? What populations? Does this work in men and women, young and old? I wanna get into, um,

uh, other areas of, of, of a- like I said, age. Um, and then finally, one thing we actually haven't really talked about is you have said it doesn't hurt fat burning. Does it do anything good? Do we have any data that suggests it does anything positive besides maybe helping me hit my protein goal? So-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... number of things I'm gonna run you through here. Uh, take me whichever one you wanna start there, and-

Dr. Michael Ormsbee
Yeah, yeah, yeah

Dr. Andy Galpin
... I wanna make sure I don't miss any.

Dr. Michael Ormsbee
So w- I think to summarize that first bit that, like you just did, I think everybody would agree that we should think of it as the, as another opportunity for a protein feeding.

In an athletic context, we gotta remember that sometimes

pre-sleep feeding isn't just a luxury, it's a requirement.

Dr. Andy Galpin
It's the only chance we have.

Dr. Michael Ormsbee
Yes. And that's what's missed. And I see a lot of times, you know, I'll comment on these if I ever see them, but just like, "Don't eat before bed." Even still you're getting it because it compromises sleep, and we'll talk about that in-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... a little while. But

there's so much context and there's so many nuances that are needed at, to say that. So let's talk about Ultraman Florida. If you finish a race at 9 at night, 10 at night, and you got a race at 5, 6 in the morning, you better eat at night. You're gonna have no shot-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... at competing tomorrow. So that's one. Also, we gotta think about day after day after day, athletes have to train or practice, so why not take advantage? When a lot of times we're under-fueled and have other issues around not eating enough, it's just another opportunity.

Dr. Andy Galpin
I work with athletes in virtually every sport in America. They almost all compete at night.

Dr. Michael Ormsbee
And then you have to do something afterwards.

Dr. Andy Galpin
We're not gonna go-

Dr. Michael Ormsbee
And then you're going to bed

Dr. Andy Galpin
... to bed without fueling.

Dr. Michael Ormsbee
So yeah. So there's, there's like that general context. I think the other piece of this that we started noticing over time, and we haven't even talked about it yet, were performance outcomes.

Dr. Andy Galpin
That's what I'm saying. Tell me, tell me the benefits here. What-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... what good am I gonna get out of this? You haven't sold me yet, Mike.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yeah. So, so the probab- the one that gets the most traction, um, is a study by Abbott, and Abbott's group looked at professional soccer players, and they played an evening match.

Dr. Andy Galpin
Oh, I know this study, yep.

Dr. Michael Ormsbee
Yeah. And then they had protein intake afterwards, and then they measured, um, reactive strength index, so they were jumping off a 30-centimeter box and told to jump as fast as they could once they hit the ground.

Dr. Andy Galpin
This is a standard metric a lot of sports performance teams will do as a test of daily readiness-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... performance, so it is not an uncommon test for them.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
They're probably doing it multiple times a week the entire season anyways, I'm sure.

Dr. Michael Ormsbee
And, and the other one that's real common too is a counter movement jump.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
So they did those two, and, and these are professional soccer players, English league, I believe. And they were,

they were able to demonstrate over the course of the next three days of doing these tests, after just the one dose feeding after the game, that they actually either maintained or came back to normal faster post-game. And so for me, that was a recovery benefit.

Dr. Andy Galpin
Totally.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
So in our data until now, we never looked at recovery. We were looking at metabolic outcomes and other things like that.

Uh, several other studies have come out around this time that show a little bit of a benefit here, something around this same space, and then some said no benefit. And so I had, um, one of my doc students, uh, Pat Saraceno, look into this, and he started notifying, um, or noticing in the literature a pattern. I looked at it with him, and we were like, "You know what's happening? Where it shows a benefit is when you exercise at night."

Dr. Andy Galpin
Mm. Mm.

Dr. Michael Ormsbee
Where it doesn't show a benefit is where you exercise in the morning. And those weren't the design of those studies. We just pulled the methods out and started looking at-

Dr. Andy Galpin
Man

Dr. Michael Ormsbee
... what time of day was this happening?

Dr. Andy Galpin
This is why it's so important,

so important for students to read all the papers and organize them somehow. I'm sure you do this a different way than I do. This is the least interesting thing ever for people who are not scientists, but I can't pass this opportunity, right? You have these things in an Excel file. You have them, and you have every variable you can in there. And I promise you, you open that Excel sheet up, and you will see massive patterns going on.

Every breakthrough I've had, every great idea I've done scientifically has become possible because of that exact thing. You notice a trend, and you're like, "Oh my gosh, four studies, seven studies, nine studies." And it, oftentimes it lines up, and that's where you can actually see things. You will never be able to notice that in a single study. You have to have a command of the literature. So kudos to you and your doc student for doing that and-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... that's really interesting.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yeah. Pat, Pat definitely drove that one home, and so we decided to design a study around it, and w- uh, simultaneously, we were interested in protein type.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
So that's what we did. We took middle-aged men, go figure-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... um, and we wanted to see how they responded to pre-sleep feeding after, after some damaging exercise. Um, you know the classic studies where-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... you do some eccentric exercises. Well, we took a protocol that-

Dr. Andy Galpin
You get them as sore as possible on purpose.

Dr. Michael Ormsbee
And we did.

Dr. Andy Galpin
It's really fun.

Dr. Michael Ormsbee
And we, and we did. And so yeah, they had, uh, I think it was 150 eccentric-only reps of extension and flexion on the-

Dr. Andy Galpin
Legs

Dr. Michael Ormsbee
... on their legs.

Dr. Andy Galpin
Yeah. Is this on a dynamometer too, so you're controlling?

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yes.

Dr. Andy Galpin
Yeah. This is a machine that's gonna hook your legs up and force them. Uh, you can control the force output.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
So they can't-

Dr. Michael Ormsbee
The pattern was, was... So we trialed it. Every-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... everybody was sore but made it through, and then, um, we had some people start the study, and we ended up getting some people through. And then we had a, a couple cases where people were, like, extremely sore.

Dr. Andy Galpin
Yeah, yeah.

Dr. Michael Ormsbee
And, and these were even f- very fit individuals. For whatever reason, they had a couple of, of issues. And so we actually ended up stopping that study short because of the extreme amount of pain that they were having.

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
Um, and they had-- We ended up finishing with only six people per group. And so the groups we had were, uh, like a whey protein,

um, a h- uh, a whey, a casein protein, a rice and pea combo. So we wanted to look at a plant-based combo and a placebo. Um, and then we, we damaged them, and then we controlled their entire diet the whole f-Study, so it was like 72 hours after the, uh, damaging exercise

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah, you gave them all their meals

Dr. Michael Ormsbee
All their meals

Dr. Andy Galpin
You gave everything.

Dr. Michael Ormsbee
Every single thing we gave them. Now, obviously it's humans, so you don't know-

Dr. Andy Galpin
Of course

Dr. Michael Ormsbee
... what they're sneaking in or, or not.

Dr. Andy Galpin
But that's a lot more control than most would do in a study.

Dr. Michael Ormsbee
We tried to control it, and of course then you get comments like, "Oh, that wasn't, that was too controlled. It's not real life." But we tried to control all these things.

Dr. Andy Galpin
You're try- you're try- to answer the question you're trying to answer, that's, that's how you design it.

Dr. Michael Ormsbee
We're trying to answer it. So we, we damaged them so much that their markers just dropped off.

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
Right? A- as you would expect, like nobody could produce a contraction that was anything. And then it just never recovered. Seventy-two hours later, we were nowhere near back. Um, and in almost every other study we had looked at, you were at least close by 72 hours later, and we just never got there. And so what we found, again, the type of protein didn't matter in that case. Everybody was too darn sore -

Dr. Andy Galpin
Yeah

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... to actually get back to normal in this particular design. And so we just had to conclude again, like it didn't... We had no difference in protein type, so that was getting at your protein type question, was,

uh, plant-based, um-

Dr. Andy Galpin
So, yeah

Dr. Michael Ormsbee
... didn't seem to matter versus whey.

Dr. Andy Galpin
While we're here, let me linger on this. I, I know you don't know the answer 'cause you haven't done these studies yet, but if you were to guess right now, then for most people, if they're trying to get the performance benefits you talked about earlier, potentially the muscle growth, I know that the recovery didn't matter in this, let's say, frankly, pretty abnormal training-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... protocol. Okay, fine.

Do you hap- do you think it's gonna matter if someone has not only protein type, whey or casein,

uh, or even food type? So if they have to have a protein shake, can they have cottage cheese or-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... yogurt? Do you have... What would you guess-

Dr. Michael Ormsbee
Yes

Dr. Andy Galpin
... is gonna... Plant protein specifically is also beneficial.

Dr. Michael Ormsbee
I love this question because we've, we... I'll give you t- two stories here. The first one is the story

© 2025 Perform Productions LLC

of our cottage cheese study.

So we were a- always wondering these, like, whole foods things, and we, at the time, we still thought that casein would be the only, like, the best way to go because of its slow-digesting kinetics and everything that we see during the day.

Dr. Andy Galpin
Our entire childhoods, we've been told casein is a slower-releasing one.

Dr. Michael Ormsbee
Casein, slow.

Dr. Andy Galpin
That's the one to take before bed and-

Dr. Michael Ormsbee
Yes, and so Luke and I have had-

Dr. Andy Galpin
Turned out the story didn't pan out very well, but

Dr. Michael Ormsbee
... conversations about that because we think it might be different w- when, when you're sleeping because you're laying supine, and it's subtle changes in pH of your stomach and these different things that are occurring. Um, and we just kind of had a hunch on it, and I'll give you the answer 'cause I actually ran this study, um, recently. Um, but the cottage cheese study was great. Went to the supermarket, pulled off a, um-

Dr. Andy Galpin
Tubs

Dr. Michael Ormsbee
... a, a tub of it, and then I sent one to a manufacturer to exactly, exactly replicate it in a powder,

the macro, all the profile. And so then I had a semi-solid cottage cheese and a liquid to compare it to, and a placebo.

Dr. Andy Galpin
Wow.

Dr. Michael Ormsbee
And so that was our neat studies. We get at, like, the consistency of the food-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Right

Dr. Michael Ormsbee
... and what is that doing with these outcomes. And what we saw in that one was, again, no difference. The cottage cheese was not different from the profile when you made it into a shake. Um, and so those two were not different from each other, all different from, um, placebo and... Well, not all. In some of the outcomes, they were better. Um, and sleep, we did measure in this one. We put on, um, some watches to measure sleep in this one. Again, we saw no differences in sleep. And so real basic design, looking at if we have a semi-solid or, or a-

Dr. Andy Galpin
Mm

Dr. Michael Ormsbee
... or a liquid, and, and there were no differences there. So it turned out casein maybe isn't the only one or the best one. And so, um,

Luke Van Loon, Jorn Trommelen-

Dr. Andy Galpin
Oh

Dr. Michael Ormsbee
... and colleagues put together a nice study looking directly at, um, casein versus whey, and they looked at, uh, mitochondrial MPS and myofibrillar, um, MPS. And there were no differences in pre-sleep feeding with taking either the whey or the casein.

Dr. Andy Galpin
Yep, in any of the ways that you can measure protein synthesis directly out of muscle.

Dr. Michael Ormsbee
And they're very good at it.

Dr. Andy Galpin
Yeah, that's just, yeah, world-leading.

Dr. Michael Ormsbee
Yeah, and so that right there was it, 'cause some people don't like the, the consistency of cottage cheese.

Dr. Andy Galpin
Sure.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
They don't like the consistency of a casein shake. It... They're different.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Um, and so mouth feel makes a big difference. If you don't wanna drink it, you won't do it. So, um-

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... if someone says, "I love casein," I'm like, "Go for it."

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
If someone lo- loves whey, go for it.

Dr. Andy Galpin
So it doesn't seem to matter protein type. It doesn't seem to matter whole food or supplementation. You've mentioned this a little in passing, but I wanna be really clear here.

You've done the assessment on men and women. You've done it in folks with obesity, folks that are young and well-trained, or you or other groups have done this. I'm gonna-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... kinda summarize the whole field here.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Uh, it's been done in young 20, 25-year-old college-age folks, middle-aged. Has it been done on older populations-

Dr. Michael Ormsbee
Yes

© 2025 Perform Productions LLC

Dr. Andy Galpin
... like 60 plus?

Dr. Michael Ormsbee
70 plus.

Dr. Andy Galpin
70 plus.

Any reason to think this answer changes with any of those demographics, or is it generally consistently saying the same thing?

Dr. Michael Ormsbee
Generally, it's saying the same thing, from everything that I've done, been a part of or read.

Dr. Andy Galpin
I'm sure there might be a study here and there-

Dr. Michael Ormsbee
Yes

Dr. Andy Galpin
... that is slightly different, but-

Dr. Michael Ormsbee
Generally, it's the same. Um, unfortunately, one of my own studies contradicted the time of day thing.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Uh, we did that with, uh, Andrew McCune and-

Dr. Andy Galpin
This, this is science, so

Dr. Michael Ormsbee
... in, in Australia, but we had some limitations to that study with time of day of exercise and performance. Um, but in general, what you're saying is accurate. Uh, one of the interesting things about this is it keeps evolving. There's still a couple things we don't know, and we're trying to work on it. So

one of the things we've done over this time is given one-off feeding, and we've usually had sleep as a secondary ter- or tertiary-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Mm-hmm, mm-hmm

Dr. Michael Ormsbee
... aim, if at all. And so we finally designed one for sleep specifically. And the thing we've done this time is we're giving three nights in a row of the feeding instead of one night, so that if you have an off or an on night just by chance, we're not picking it up as artifact-

Dr. Andy Galpin
Mm

Dr. Michael Ormsbee
... that we can hopefully, you know, get a better number of nights involved with this. And it's a lot of work 'cause there's nighttime things involved. Um-

Dr. Andy Galpin
We can help you on the sleep front.

Dr. Michael Ormsbee
Let's go.

Dr. Andy Galpin
There's a lot better ways to do that.

Dr. Michael Ormsbee
So we're doing that right now, and we're doing that in Division I female athletes-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... um, which is fantastic. So that's ongoing this, um, this whole y- academic year, so we should have some answers on that ex- on that next year. We also put a CGM on them-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... so we could continually monitor how glucose fluctuations are occurring through the day and through the night, um, over this period of time. Um, and then the, the last thing I'll say about that, which is reallyI think the way that it's going, there's a new player in the protein world-

Dr. Andy Galpin
Ooh

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... in pre-sleep feeding.

Dr. Andy Galpin
Oh.

Dr. Michael Ormsbee
And, uh-

Dr. Andy Galpin
Is this breaking? Are you putting it on before-

Dr. Michael Ormsbee
It's, it's-

Dr. Andy Galpin
This is the first the world-

Dr. Michael Ormsbee
It's been out, yeah

Dr. Andy Galpin
... is gonna know about this?

Dr. Michael Ormsbee
It's not, um, it's new to this space, so it's being marketed for sleep. It's called alpha lactalbumin. It's a, again, fractionated from dairy protein.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Now, I was unfamiliar with it, and it's actually very common. It's in mother's milk, and so it's in f- infant formula powders. And it's high in tryptophan.

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
And so linking those together, someone said, "High tryptophan, baby's sleeping, maybe adult's sleeping, let's fractionate it, bottle it on its own, and give that to people." And so there's already been two studies on it, and both of those were in Australian rugby, and both of those showed a benefit on sleep outcomes.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Hmm.

Dr. Michael Ormsbee
So we're running that study now, uh, with our Division 1 female athletes, and alpha lac will be one of ours to see if it's actually, um, doing it or will it end like our other studies where there's no difference in things. But right now we're excited about it because there was evidence from two other studies, and we're just doing it a bit more controlled in, in, uh, in our approach to it.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
So alpha lac's kind of the new player there.

Dr. Andy Galpin
Okay.

I think we're kind of winding this story down. Uh, a couple of things I want to clarify. You've also mentioned ad nauseam, at this point, there is no reason to think a meal like this

should interfere with sleep. Of course, if the individual person, it upsets their stomach, gives them acid reflux or something, then stay away from that.

Dr. Michael Ormsbee
That, that's a really good point. We, we have to... You have to know how you react to things.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
The other thing is you take... You could potentially be taking a large amount of fluid right before bed.

Dr. Andy Galpin
Oh, right.

Dr. Michael Ormsbee
If that makes you wake up and urinate too much, then it's probably also something you would want to have a different form or maybe try to have your protein intake at different times.

Dr. Andy Galpin
Folks, you don't have to fill the whole shaker with water.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
You can fill eight ounces and shake a little bit.

Dr. Michael Ormsbee
Yeah. And, uh, so yeah, the, the sleep part of this is gonna be sort of the next big story. And we're currently, um, in negotiations to, to, to try to run another study because there's two things we're still missing. I wanna know if there's a difference between the quality of the food you're taking or not. So could you have a, a mixed macronutrient profile that's still relatively low in calories, and how does that compare to something that's, like, ultra-processed?

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
And so that's one we're trying to run next, is to look at specifically what is going on with the quality of the, of the nutrient profile. And the other one, is there, is there a calorie threshold?

Dr. Andy Galpin
Okay, perfect. Perfect.

Dr. Michael Ormsbee
That's where I think we need to go because 544 in the first study seemed to not be good,

and we're gonna try to do, like, a 0/400/800.

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
And then, um, the idea would be to, if we can pull it off, would be to mask it and, uh, and probably put it into something like a milkshake.

Dr. Andy Galpin
Okay. I got three final short follow-ups to this one, but you led me perfectly into here.

I think I know the answer based on what you just said, but at this point, is it something special about protein? You actually said your first study was protein, it was carbohydrate, and it was, I don't know, multiple forms of protein.

Dr. Michael Ormsbee
Mm-hmm.

© 2025 Perform Productions LLC

Dr. Andy Galpin
And you saw no difference between the carbohydrate and the protein for the most part in those measures-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... that you had, right?

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Do you think it is the protein, or is it going to just simply be the fact that it is a small, in your case, easily digestible, you have pre-powdered-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... small amounts, easy to get through your stomach foods?

If you had to guess right now, it's gonna be clearly a combination of these, but if... Is it the protein, or is it the meal size and digestibility?

Dr. Michael Ormsbee
Yeah. I... It's probably-

Dr. Andy Galpin
Tell me the answer to your new study that you haven't done yet.

Dr. Michael Ormsbee
I think that we're gonna have something to meal size-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... and digestibility. Um,

however, we don't know the answer for sure. But just like some of the other studies I described, we, we sometimes think we know what's going on, you can... and then you have to just do the study to show it. So I think we're gonna find something to the calorie threshold theory.

© 2025 Perform Productions LLC

Dr. Andy Galpin
I would bet a lot on that.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Simply coming from a-

Dr. Michael Ormsbee
Es- es- especially with sleep.

Dr. Andy Galpin
Yes.

Dr. Michael Ormsbee
So that's where we get mixed results. If you look at sleep data, if you do eat large calorie meals before bed, sometimes-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... it does mess with sleep. And I don't think it's fair to say eating before bed messes with sleep. It's specifically what are you doing before and aft- before act- before sleep, and what exactly are you eating?

Dr. Andy Galpin
Because I can tell you right now, having done this a lot, if you give people an easily digestible carbohydrate, high fiber, an easily digestible protein under a total amount of volume and calories, probably 300 or so,

you rarely have sleep issues. In fact, many, many times you'll see enhanced sleep. And one of the one things that you'll-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... the biggest things you'll see is the next morning inertia, so the grogginess you feel when you wake up the next morning,

is oftentimes improved.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Mm.

Dr. Andy Galpin
Not in every single person, but rarely have we seen that hurt people.

Exceptionally, again, I may, I get a little heartburn from it, things like that. My stomach felt like a rock. Okay, fine. But you have very small meals like that,

I, I would... I know where I would put my money. I don't know-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... what your data's gonna find, but I think-

Dr. Michael Ormsbee
No

Dr. Andy Galpin
... you're onto something there.

Dr. Michael Ormsbee
I think we see it like, like you're saying in these, in the people we work with. But when, when we're doing this in a study, we can really control it and find out exactly what's happening. So that's where I think we're gonna go with it. The, there are data, like, uh, I think it was the Falkenberg study, and they were looking at all types of macros before bed, and it was, like, lower glycemic-

Dr. Andy Galpin
Uh-huh

Dr. Michael Ormsbee
... higher fiber, and, and protein actually were all helpful with sleep. And so those are the things that we're really doing here. That's what we'll be looking at in these new studies if we can get them launched with our grant funding.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um, and I feel like that's probably gonna be the, the answer, is we're gonna have a threshold and probably a quality of food as well. The, the oddest question I ever got about this was, does it

© 2025 Perform Productions LLC

mess with your teeth?

Dr. Andy Galpin
Yep.I can see that

Dr. Michael Ormsbee
And I thought I've never asked that question, but normally I think people would have it and then brush their teeth before bed. So we haven't gone down that pathway yet.

Dr. Andy Galpin
Pre, post teeth brushing.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Yeah. Not my area. Okay. The last little one, and then I wanna make sure we wrap this thing here. Um,

have you guys actually looked at this

in either a calorie-controlled throughout the day fashion or a specifically non-calorie controlled-

Dr. Michael Ormsbee
Mm

Dr. Andy Galpin
... for long-term fat loss? So, okay, I get it. You sold me. I might recover better. I might grow some more muscle, and my fat oxidation rate the next morning maybe won't change. Okay, you sold me. I won't hurt my sleep, blah, blah, blah. But am I going to lose more fat? Am I going to gain more fat? What do we know about eight-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... 10, 12 weeks long?

Dr. Michael Ormsbee
Yeah. So it's a little bit,

um, extrapolated from other studies we've done where just by chance there was an evening protein shake.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Ha ha. Okay.

Dr. Michael Ormsbee
Yeah. So one of the earlier studies, I think it was a 2002 with RC Arrow, we were looking at, um...

it was an old program called Body for Life that Bill Phillips-

Dr. Andy Galpin
Oh, sure

Dr. Michael Ormsbee
... developed.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
So we did the first study on that. So Paul got that grant, and I was the student in the lab helping on that study. And that one included, um, six meals a day, and three of them were shakes.

Dr. Andy Galpin
Sure.

Dr. Michael Ormsbee
So you had a mid-morning, mid-afternoon, and an evening protein shake, and then we did that for 12 weeks of training, and that training was, like, three days a week of, uh, 20 minutes of HIIT, three days a week of, uh, resistance training. So it was, like, six days of exercise. It... Great. I mean, really good outcomes come-- were coming from that. When that was compared to something like the traditional American Heart Association recommendations, which were definitely more carb-heavy, definitely less protein dominant, and mostly, um, at that point, just physical activity like walking, getting some more exercise throughout the day. Um, when you had the pre-sleep included in the total, like, r-regimen you were following, those folks had far greater outcomes in terms of abdominal fat loss, visceral adipose tissue loss, um, and strength and actual, like, performance outcomes over that period of time.

Dr. Andy Galpin
Okay. So would this be fair to characterize the entire field, uh, both your work and others as best we know it now, seems to be pretty ubiquitous in terms of the groups, the population. It won't matter post-menopause, pre-menopause, young, old, so on and so forth. The type of protein perhaps doesn't matter, and that if you're already hitting your protein targets, then this is not gonna potentially have any massive benefit, but it doesn't seem like it's gonna harm much either.

© 2025 Perform Productions LLC

If you're already doing it, probably okay.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
If you're already not doing it,

you don't necessarily need to go add this as long as you're hitting your total protein throughout the day. So this is not anything miraculous, but it is just another option, and it is perhaps most importantly something sh- people shouldn't be afraid of.

Dr. Michael Ormsbee
Absolutely. Yeah, that's the biggest thing. Ev- um, you know, I'm always asked about it, and it's, it's really just the exact thing. Don't be afraid of it. If you're hungry, you have an option. You can eat something, and it's probably gonna do either nothing or it will help you.

Dr. Andy Galpin
Really, really, really beneficial when dieting.

Dr. Michael Ormsbee
No doubt about that.

Dr. Andy Galpin
If you know you can turn to a 25-gram shake at night and you're just... the hunger button is hammered to the bottom-

Dr. Michael Ormsbee
Yeah, yeah

Dr. Andy Galpin
... almost nothing is gonna happen negative in response to that.

Dr. Michael Ormsbee
100%.

Dr. Andy Galpin
Today's episode is sponsored by AG1. AG1 is a vitamin mineral drink with probiotics, prebiotics, and adaptogens. Initially, I was extremely skeptical of AG1, as I am with all supplement companies, but after months of discussions with their lead nutritional scientist and the general team at AG1, I've been impressed by AG1's commitment to sourcing the highest quality ingredients and constantly updating their formulas to have the right ingredients in the optimal amounts. By now, it is abundantly clear that the gut microbiome plays a critical role in everything from body composition to bone health to mental health. And the probiotics and prebiotics in AG1

© 2025 Perform Productions LLC

help to promote a healthy gut microbiome, improve digestion, reduce food cravings, and increase short-chain fatty acids, which play a critical role in regulating metabolism and immune responses. It's for these reasons and many others that I personally take AG1 almost every day. Now, it's of course not a replacement for eating whole, healthy foods, but it is a great way to make sure that you're plugging in any gaps in your nutrition to improve your energy, bolster your immune system, and just generally help promote a healthy gut microbiome and more. If you'd like to try AG1, you can go to drinkag1.com/perform to receive five free travel packs plus a year's supply of vitamin D3 plus K2. Again, that's drinkag1.com/perform to receive five free travel packs plus a year's supply of vitamin D3 plus K2.

Well, thank you for giving me such a fantastic breakdown of, of your 15 years of work in the area of pre-sleep and probably most importantly justifying my what is basically a nightly routine now, especially when I'm on the road of I absolutely smash a David bar before bed all the time. Uh, literally never stop o- on the road. It's like dessert sort of thing for me, but, uh, I feel justified, and what I'm hearing you say is there's zero problem with that, so I can continue that habit.

Dr. Michael Ormsbee
Yeah, you got it from me.

Dr. Andy Galpin
Appreciate it. Uh, I wanna transition from protein and talk a little bit more about carbohydrate. You've done a lot of work-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... in this area as well, and there are perhaps

more things we can learn here that are counter to what m- uh, other folks have talked about or seen in the past. So, uh, walk us through some of the stuff you've done on specifically these resistant starches, uh-

Dr. Michael Ormsbee
Sure

Dr. Andy Galpin
... in your lab.

Dr. Michael Ormsbee
Yeah. So we got interested in theModified carbohydrate space-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... a while back. And it started with a, a student who was hyper-interested in carbohydrate.

Dr. Andy Galpin
Isn't that the best? Like-

Dr. Michael Ormsbee
Yeah. It, it... And they, they drive... I mean, my lab is so fantastic. I- They're, they're all brilliant. They're so much smarter than me, and I love that because they just have great ideas, and we can weave it into stuff that we can get funding for, and it's, it's just, it's just a really good mix. But I had this, uh, student at the time, Dan Bauer, who was a phenomenal student and hyper-interested in, in all things carbohydrate. And I was kind of protein dominant for all of the work-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... I was into. So it was a great addition to what we were doing there to round out sort of some of our macronutrient profiles that we were interested in. Um, he started with a review paper that we sort of team wrote to just get the history of what's going on with these. And i- if, if you're unaware of these modified starches, um, well, regular starch, for example, has structural components of it, like amylose and amylopectin, and they will dictate the rate at which it will be digested. When you modify that starch, you do that... You can do it several ways, chemically or we were using hydrothermally modified, so it was like water and heat-

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... and pressure, and you can change it. Um, it, it doesn't matter any longer what the amylose/amylopectin ratio is.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
That's out the window. It doesn't even matter. So that's what students get tripped up on a lot is like that once you modify it, that's no longer a thing.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Right. This is the heat it up, let it cool back down.

Dr. Michael Ormsbee
Yes. Um, and so the, this, the particular product we started with was, um, designed for people with glycogen storage disease.

Dr. Andy Galpin
Oh, McArdle's.

Dr. Michael Ormsbee
So there, there's a glycogen st- It's separate, too. There's a... Outside of McArdle's, there's, there's glycogen storage disease, where you cannot store glycogen. And so what you have to do, it, what, what was developed was a, a version of this super starch that was slow drip, didn't raise insulin, and kept glucose steady for long periods of time. And so that's how it was used for, for ages.

Dr. Andy Galpin
Oh, so a different problem than breaking down carbohydrate-

Dr. Michael Ormsbee
Correct

Dr. Andy Galpin
... in McArdle's, right?

Dr. Michael Ormsbee
You can't store it at all.

Dr. Andy Galpin
Ah.

Dr. Michael Ormsbee
If you can-

Dr. Andy Galpin
Different enzymatic problem.

Dr. Michael Ormsbee
Yes.

Dr. Andy Galpin
Still genetic, I'm assuming.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Absolutely.

Dr. Andy Galpin
Enzyme link. Okay.

Dr. Michael Ormsbee
Yeah. And so what athletes do, they hear about this. I, what I love is that the clinical goes to the athletes, and the athlete kind of work-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... also goes to clinical. So I'm thinking of cases like, you know, creatine in athletes, athletes over to clinical, and then in this case, clinical with the glycogen storage disease coming back to athletes. So athletes hear slow drip glucose.

Dr. Andy Galpin
Sure.

Dr. Michael Ormsbee
Here we go. Uh, some companies got involved, and they, they made a, what, what was called UCAN SuperStarch. Um, and so we decided to start testing it because there were a lot of claims around it, and, um, it was just nice. We were able to f- really over several studies decide, um, you know, what design do we need? Because the super starch folks would say that you would need less, uh, of a f- of a serving than you would of a normal carbohydrate. So for example, if you normally have 60 grams per hour, with the super starch, their, the claim was you could do maybe 30 grams per hour. You don't need as much of it. It's a slow drip, and then it wouldn't raise, um, insulin concentrations either-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... which I don't know that's a good or bad thing, but it just wouldn't do it. Um, and there were a couple studies on it, like Mike Roberts' group did-

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... a little bit with it, which was how we sort of knew about it. Um, and we just sort of took it

© 2025 Perform Productions LLC

another step. We used the microdialysis probes again, and we started with cyclists. And so we brought in, um, well-trained... They were very well trained. They weren't elite, but they were very well trained cyclists. Um, and so we put them through, or Dan put them through this gnarly protocol where we made it as gut-jarring as you possibly could with interval sprints and all these different protocols and a long duration. Um, and we wanted to see 30 grams of it, which would be like a low dose, and then we also gave 60 grams of it because that's what was recommended-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... was 60 grams of carbohydrate. And then we compared that to what's traditionally used in a, a over-the-counter, um, sports drink. So we compared it to other sports drinks as well. And in the first study, we saw that s- when you compared 60 grams of the super starch to 60 grams-

Dr. Andy Galpin
Uh-huh

Dr. Michael Ormsbee
... of a sports drink, um, the biggest trouble was that the super starch induced more GI upset.

Dr. Andy Galpin
More?

Dr. Michael Ormsbee
And there, the... Unfortunately, the, the claims were that there were, was gonna be less-

Dr. Andy Galpin
Less, yeah

Dr. Michael Ormsbee
... GI upset. But in our hands, we actually saw more GI upset.

Dr. Andy Galpin
And it's the subjective reporting of cramping-

Dr. Michael Ormsbee
It is, yeah. It's like a, like a visual analog scale, and it's a-

Dr. Andy Galpin
Right

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... a 10-point scale, and you mark a line with where you feel.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um, and nausea, um, wanting to vomit, that kind of thing. It was, it was a tough protocol.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
So that's not good. Um,

and performance, the outcomes we had were actually not different. You just felt terrible.

Dr. Andy Galpin
Hmm.

Dr. Michael Ormsbee
So, like, if you're talking about rating a perceived exertion, and that can really dictate y- or, or limit-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... like, how well you perform-

Dr. Andy Galpin
For sure

Dr. Michael Ormsbee
... uh, you think it's harder.

But when we compared it to the 30-gram dose, which is what was typically recommended, like a lower dose, you don't need as much, um,

worse performance.

Dr. Andy Galpin
Hmm.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
No GI upset, but worse performance.

Dr. Andy Galpin
Sure.

Dr. Michael Ormsbee
So now you're in a case where, okay, there's, there wasn't any GI upset, but you weren't taking enough.

Dr. Andy Galpin
So you got the worst of both cases here.

Dr. Michael Ormsbee
So yeah, you got in this other case. And so at the highest dose, if you could train your gut, then perhaps it was something that you could use, uh, but you could also just use another dr- sports drink and have a similar response. I will say two things about it, though. A mistake that was made perhaps that we did and could do better was that we didn't familiarize people to taking it. People were used to the sports drink we were, the other-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... the comparator.

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
But they'd never, like, had it before. So perhaps we should have given it for a while beforehand and then tried it. Um, but it's-

Dr. Andy Galpin
Were you giving this in the form of liquid shake?

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Liquid shake. It shouldn't be any different, but-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Ah

Dr. Michael Ormsbee
... nevertheless, that's a comment that, that we received, um, -

Dr. Andy Galpin
I don't know about that

Dr. Michael Ormsbee
... in that, in that front. So-

Dr. Andy Galpin
Having taken... The only reason I'm saying that is I've taken a lot of resistant starches in various forms, and I've, I've never noticed a first time or, or learned effect of-

Dr. Michael Ormsbee
Yeah. You wouldn't think so, but it's plausible.

Dr. Andy Galpin
Sure.

Dr. Michael Ormsbee
Yeah. It, it maybe-

Dr. Andy Galpin
Plausible. Good scientist you are.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
It's plausible.

Dr. Michael Ormsbee
It's plausible. Um, uh, the other thing we wanted to see wasMaybe we needed to jostle the gut a little bit more-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... and do running.

So in a follow-up study for Dan's dissertation, he got two dissertations out of this.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Geez.

Dr. Michael Ormsbee
Um, he went after runners, elite runners, and some of these runners were, were running like 14-minute 5Ks-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... and things at a very-

Dr. Andy Galpin
Pretty good

Dr. Michael Ormsbee
... very fast. After running for an hour at, uh, marathon pace, you know?

Dr. Andy Galpin
Wow.

Dr. Michael Ormsbee
So we... It was a good protocol again. Um, and we also put microdialysis probes in their belly while they're running and doing all this-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... uh, which is a feat in itself 'cause everything's jostling.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
So you had to tape everything down pretty good, um, 'cause we were also interested in what fuel were being used. And so Dan always would say, like, "Just because, um, you can change the fuel use, should you?"

Dr. Andy Galpin
Sure.

Dr. Michael Ormsbee
You know? So, you know, just like any other feeding studies where you limit a certain

© 2025 Perform Productions LLC

macronutrient or another, you can change what's oxidized because you're eating differently or you're exercising at a different pace or what have you. Um, and this was the same thing with UCAN. Like, we could change the fuel that was being utilized, and insulin, by the way, didn't rise. So that claim was right. It, it stayed low, and glucose stayed quite steady. You didn't have any spikes or anything. So, um, in the running study, it basically mimicked the cycling study, even though we were trying to jostle even more and make sure we had GI upset if we were gonna see it, and it just ended up being fairly similar. And the fat ox- the fat metabolism piece didn't add much to the story in, unfortunately, in that particular study. So I could see a couple uses. It does give you sustained glucose for a long period of time.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
If you're in a sport by which you cannot feed for a long time, maybe it's useful. Um, maybe long-distance swimming

i- would be an example where you could potentially use it, or, or some time when you just don't want to carry a lot of fuel with you, or maybe you're having, I don't know, uh, some type of sporting activity where you're not able to eat a lot.

But then we thought about pre-sleep feeding.

And I thought-

Dr. Andy Galpin
I thought we were done here, but no

Dr. Michael Ormsbee
... can I take it before bed-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... and then run a faster morning race without having to wake up and eat in the middle of the night, like a, a lot of people who run endurance races would do? Um, so then we designed one where we took UCAN super starch right before bed, compared that to, uh, our traditional, uh, glucose drinks.

Dr. Andy Galpin
Were those calorie match protocols?

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
So you're just switching it out-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... for... What did you switch it out for?

Dr. Michael Ormsbee
So we would take just regular carbohydrate, or we would take the UCAN super starch.

Dr. Andy Galpin
What was the regular carbohydrate? Do you remember?

Dr. Michael Ormsbee
Just the sucrose.

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
Yeah. Um, we would mix it, and then one of the things, uh, I was like, "Well-"

Dr. Andy Galpin
So sugar water or this?

Dr. Michael Ormsbee
Or, yeah. So m- calorie matched, and, uh, we were doing five-

Dr. Andy Galpin
Macronutrient matched

Dr. Michael Ormsbee
... macronutrient matched, and they... I was hopeful that we would see maybe like, oh, you don't have to get up so early, and it was lasting so long. So the only thing we did see, which was kind

© 2025 Perform Productions LLC

of neat, was that you didn't... or that you did have an increase in carbohydrate burning in the morning, which theoretically could help with performance. It didn't translate to it in our hands.

Dr. Andy Galpin
Well, it certainly indicates there's something physiologically happening.

Dr. Michael Ormsbee
There's something happening.

Dr. Andy Galpin
It's still going on in there, right? You've still enhanced it. If you were to simply ingest carbohydrate right now-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... your-

Dr. Michael Ormsbee
Right

Dr. Andy Galpin
... carbohydrate burning goes up, right?

Dr. Michael Ormsbee
Exactly.

Dr. Andy Galpin
This is the whole premise behind why many folks got it wrong in saying, "Well, these higher fat diets or eating more fat helps you burn more fat." Anything does. If you eat more protein right now, you burn more protein right now, right?

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
You eat more carbo... But the fact that it lasted overnight indicates that the next morning the sugar water-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... wasn't still around-

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... but the gluco- the starch was.

Dr. Michael Ormsbee
And w- in other studies, we've had chocolate milk before sleep and, you know-

Dr. Andy Galpin
Sure

Dr. Michael Ormsbee
... different things, and we... Same thing. You're still burning a bunch of carbohydrates in the morning, and that may be able to translate to performance, but we just didn't... We haven't seen it yet. We haven't been able to tease that out in a running example.

Dr. Andy Galpin
Yeah. So by default then you would've probably lowered fat oxidation.

Dr. Michael Ormsbee
Mm-hmm. Yeah. And, and that's, and that wasn't exactly what was happening, but perhaps we didn't have... Something wasn't right. W- Maybe the dosing was wrong because even with protein, you have to do... The, the ideal dose is 40 grams-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... which is bigger than a lot of people are used to because you're going so long until you're using it again. Like, all night long you have to have it. So maybe with carbohydrate, we just needed a bigger dose.

Dr. Andy Galpin
One of the things that I appreciate so much about not only the conversation we're having, but your research line in general,

is you're not only a scientist, but as I mentioned at the beginning, you, you've run these races. You're an educator. You have courses on this. In fact, you know, again, like I mentioned at the beginning, that Florida State Educator of the Year I know is on your resume as an award. Um, you're putting these things into practice. You have the literal textbook in the field. You, you, well, you, you have the... You wrote the textbook in exercise physiology,

and it's so clear that when you go after one of these studies, you don't just stop. When you're on

© 2025 Perform Productions LLC

here, w- when you're having these conversations, you're not just saying, "Okay, this is our answer," because you know if you change one variable, maybe it changes.

Dr. Michael Ormsbee
Mm.

Dr. Andy Galpin
And the... Why I'm bringing this up now is you just reminded me that as you said, "Well, maybe we had the wrong dose. Maybe it's the wrong time. Maybe it was the wrong combination. Maybe it's the wrong person." That's a really hard skill, and you rarely hear scientists talk like that because they want to have a capture of an area, and they want to have clear answers. The world wants-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... a clear answer, but in... Because you're such a practitioner,

you know that's not really how it works. So I really appreciate that about your perspective, the way that you teach, and the way you run your lab because you're doing 10, 15 years of the same kind of study with multiple variables changed out to understand the real answer there. This is not gonna influence your funding. This is not gonna get you promoted-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... or bring more money. It's really, honestly, I, I'm as- you know, jumping into your brain a little bit here, but you're generally trying to answer the question, and you know that there's real life, there's multiple aspects, there's just trade-offs. There's not simple answers, so-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
Another compliment coming your way for your approach there

Dr. Michael Ormsbee
I appreciate it. Yeah. It's, it's, it's great to do, though. I mean, that's the luxury of, of having a facility and a location where we can, um, have the funding and the resources to, to do-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... some of those studies. Um, and a team. And the team's all about it. And, uh, I think everybody comes in knowing kind of the, the general areas we're gonna go in, and, and we're all in, you know? What I told you earlier, we're like, we're trying to create this culture that you go into a research lab or... For example, if you go into an athletics facility, you usually see all the, all the swag and all the things-

Dr. Andy Galpin
Yeah, yeah

Dr. Michael Ormsbee
... it just feels good, right? And so I love that, and I wanna replicate that as best I can in research, where you come into the facility, you know here we're gonna do great work, but it's also gonna look nice, and we're gonna have things that make you wanna be a part of what we're doing. And it works. I mean, the, the students buy in, the faculty that are present buy in, the, the research subjects wanna be there instead of just, you know, stuck in a basement that's got no windows.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
You know, it's, it's just a great, it's a great spot.

Dr. Andy Galpin
Yeah, man. There, there's, there's love for being in the basement, I get it. Like, some of my fonder memories of-

Dr. Michael Ormsbee
I had a lot of years there.

Dr. Andy Galpin
Yeah, but having dealt with that for most of my career and now having the exact opposite at Parker, I get it, man. Having nice facilities and being able to do stuff, it, it changes everything.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
So, so the UCAN, uh, the SuperStarch didn't do much in the, what, four studies you did in that

© 2025 Perform Productions LLC

area?

Dr. Michael Ormsbee
Three, yeah.

Dr. Andy Galpin
Three different studies.

Dr. Michael Ormsbee
Three.

Dr. Andy Galpin
I have personally used resistant starches, um, mostly o- candidly, I've pretty much used Vitargo-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... for the most part, which is a slightly different thing, but similar concept here, with a lot of success in totally different applications and totally different scenarios than you. So I think, uh, perhaps, I don't know if... Are you gonna continue that research line, or you feel like you got that answer solved and you're-

Dr. Michael Ormsbee
We haven't had any more pursuit of that answer. But with the product that you're talking about, I think that there are other things that could be done in that particular space.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Because that's modified to be different, right?

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
That's modified to be fast digesting.

Dr. Andy Galpin
Uh-huh, 100%.

Dr. Michael Ormsbee
But I don't believe all the data. And I'd love to do a study with it, um, because I think it's got a lot of potential, and I know a lot of practitioners love it.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
But it was the same way with UCAN-

Dr. Andy Galpin
Of course

Dr. Michael Ormsbee
... SuperStarch. So, um, there's something always to all these types of studies, especially with supplements. Like, if you like it and you think it works, then it works.

Dr. Andy Galpin
Oh, boy.

Dr. Michael Ormsbee
So we need to stay there. However, I'd love to do those comparison studies with Vitargo, because I know some of the data were like t- the first 10 minutes were extremely fast, then everything-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... stopped. And if you look at after the 10 minutes, then you have issues where it doesn't go any faster.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
But the net was still more. And so I, I'm, I'm... There's just th- questions I'd love to ask about in there.

Dr. Andy Galpin
I'm sure you have plenty- ... of questions about that. The, uh, the, the post-extreme caloric restriction, so weight cutting scenarios in different sports, we've used it in to, as a very fast recharge, if you will. As a part... As not your first line, uh, of defense, but d- many different scenarios. Other extreme,

I will just say, scenarios folks are in, where fuel is gonna be very limited and unpredictable, then the- these can be benefits. But I would agree, I would love to see you and Vitargo, I guess,

© 2025 Perform Productions LLC

k- kinda contact Mike, and maybe you guys can come up with some- ... some cool stuff. But more work for sure is needed in that area.

Dr. Michael Ormsbee
Yeah. Yeah, and h- honestly, everybody that I know uses it tends to like it. I just, I would love it, because, uh, the studies that I've read-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... on the, the modifications, I'm just... It's not clear cut to me.

Dr. Andy Galpin
Ah, yeah, yeah. That's... I mean, this is the beauty of how our field works. You said this just a few minutes ago. Clinical influences the science. The science sometimes influence the clinical. So you have a lot of clinicians and athletes and folks-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... making comments, and great, let's bring it to the lab. Let's see. And that's not to, to ruin it, to end it, to say it doesn't work, but it's simply to say maybe it doesn't do A, B, and C.

Dr. Michael Ormsbee
Yeah, or there's a different use for it.

Dr. Andy Galpin
Totally.

Dr. Michael Ormsbee
Yeah. Uh, so, like, these,

the, the grants and the funding sometimes come from these companies, and-

Dr. Andy Galpin
Most of the time

Dr. Michael Ormsbee
... and that's how you would get work done on those. Um, and that's a different conversation. If we wanna have it, we can, but let's just say everything's kosher, because that's how we run the facility.

© 2025 Perform Productions LLC

There's a lot of things you can look at with a different lens. Like what sport works where you have not a lot of fuel for a long period of time?

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Well, maybe there's a use. Or maybe you're the age group athlete and you're not gonna win, and you don't want insulin spiking all the time in a race where you're-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... out there for a long period of time, then maybe that's a really good product.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
You know? So there's, there's different uses, different people. You gotta really just know the individual.

Dr. Andy Galpin
Yeah, 100%. So we went from protein, we went to carbohydrate. Uh, let's go on actually to a little bit of a different macronutrient-ish. Collagen.

Dr. Michael Ormsbee
Hmm.

Dr. Andy Galpin
I know you've done work in this area. In fact, you were telling me earlier, I didn't realize this, but your one study was the longest ever study done in collagen. Is that right? In humans.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Of course.

Dr. Michael Ormsbee
Nine months.

Dr. Andy Galpin
So there's a lot of them going on, and I'll, I'll actually, I'll just be honest, um, my answer has

© 2025 Perform Productions LLC

changed on collagen probably in the last nine to 12 months. I know, I remember, and I'll save names here, but people have been talking about collagen specifically for soft tissue injury.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
And work there initially came, of course, out of animal, uh, mice and urine models and other things. And I'm generally a person who says until it's at least somewhat shown in human,

I'm not gonna say it doesn't work, I'm just not really gonna be concerned of it.

I, I think it's really important that people understand where they are at personally on that line. So you have kind of over on one end of the spectrum, unless it's been shown in five randomized control, double-blind placebo studies, I'm not taking it.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Okay, fine. I personally don't live in that world. I deal with most of the athletes and clients are, are never gonna have a randomized control trial on them population-wise. Other folks other end of the spectrum is if there's even a plausible cell culture study, like I'm all in.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Okay, I'm probably in the middle. If I'm, if I would be honest, I'm a little bit hedged more towards the right, the, the, the clinical trial. Let me see it in humans at least. Ideally not in just like a case study onlyIt's a variable I care about, somewhat trained or whatever population I'm looking at. So my personal bias is I'm there. What that means is I'm sometimes slow, sometimes behind, people are taking things before I would, but I'm okay there because on aggregate, I generally win in the sense that I avoid things, not taking things. I stop doing procedures and products where other people have tried because I'm like, well, eventually it turned out that sort of not work.

Dr. Michael Ormsbee
Yeah, for sure.

Dr. Andy Galpin
So I think it's fine. People can be wherever on the spectrum they want. I don't think there's any issue as long as they are either aware with themselves or their athletes or clients or customers

© 2025 Perform Productions LLC

where they're at on that journey. For me, collagen was on that left end. It was very much, um, I don't see much here. I don't see much here plausible. Then some human studies came, ah, I didn't see much there. It's changed. Like it really has changed recently, so much so now where I think, okay, I think there is something here, there, and there's enough for me to take action. So we have integrated collagen a lot more-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... on this. So where are you at on that spectrum? Tell us about, you know, that study you did there, what you guys learned-

Dr. Michael Ormsbee
Sure

Dr. Andy Galpin
... and in general, your take.

Dr. Michael Ormsbee
Right. So we, we began this work

six years ago, and it was originally, um, for the purpose of looking at dosing.

When we looked at the literature before we began, there were, um, a lot in like skin healthcare beauty-

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... space.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Um, and that dosing was like five to 10 grams a day, and man, they had like these fairly decent outcomes over-

Dr. Andy Galpin
Yep

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... many, many studies, and so I think there was some evidence in there. But then I was like, all right, I'm used to whey protein. What is going on with this? I'm used to like muscle outcomes or fat metab outcomes,

body comp outcomes. Um, there were one or two papers that actually showed that collagen had some, um, uh, uh, benefit in that space, but they weren't compared to whey. They were compared to nothing.

Dr. Andy Galpin
And it's usually at a very low total protein intake and things like that.

Dr. Michael Ormsbee
Yeah. And it's in one lab where it's showing this and, and that kind of thing. So we always wondered, well, maybe these should be s- uh, not compared, or we have to look at what the outcome is. If you're looking at muscle, I wouldn't use collagen for muscle.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
And I think s- like Stu Phillips has said that over and over in-

Dr. Andy Galpin
Sure

Dr. Michael Ormsbee
... some of his work, and, and it is right. I think-

Dr. Andy Galpin
He says it a little more aggressively than that, but okay.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Uh, but for muscle, no, it's not, it's not where you want it. The, the amino acid profile isn't there. So we were specifically looking at joint pain. That's what our outcome was, and it was in, um, middle-aged and older lifelong active people. And so it was a, a fun time recruiting these individuals. Some golfed every day, some ran every day, but some were, um, elite CrossFitters, some were triathletes. So all kinds of a range of people, but they're all active every single day,

© 2025 Perform Productions LLC

uh, or not every single day, but very-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... active for recruiting purposes. And then we gave them either zero, 10, or 20 grams of collagen per day, and it was designed as six months, but as we were getting closer, we said, "Well, if we're doing it this long, let's see if we can keep them on and do nine months so maybe we can look at bone."

Dr. Andy Galpin
Hmm.

Dr. Michael Ormsbee
And then we're like, "Well, we probably need a year, but let's see if we can get nine months and see what's happening."

Dr. Andy Galpin
Yeah. That's right around the number, right? Where if you see bone mineral density changes in six months, you probably have to be in a severe-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... drug protocol, damage protocol, caloric restriction protocol or something. By 12, you'll see it. So I only wanna flag that for people to realize if you're looking at body composition, muscle growth, performance, sleep, diges- those can happen in weeks.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Bone takes a very long time, and I think you nailed it. Nine months is probably right on that tipping point-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... for most people.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
It was. And, and I, I... So we were still underpowered at that point, unfortunately, for bone. So we were still primarily focused on, uh-

Dr. Andy Galpin
It's like, maybe we get it.

Dr. Michael Ormsbee
Yeah. We'll see. We'll see.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And so we offered the opportunity for the people who volunteered for six months to stay on for three more.

Dr. Andy Galpin
So this is, they're doing the six-month study, and then along the way, you're going, "Hey, guys, if you wanna keep going, by the way, we'll keep coaching you, and we'll keep giving you product."

Dr. Michael Ormsbee
Yeah. Like three months in, we wrote to the funding agency-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... and I said, "I think we should extend this, but it's gonna cost X amount to do that. Are you on board?" And so they were on board with doing it, so we ended up extending it. Um, and a couple interesting things came from it. It was mostly questionnaires in our study 'cause we were looking at joint pain, and we tried to use, like, goniometers for range of motion and some of these other things, and we did some t- more high-tech tools that we had, but they weren't working. Uh, there was too much variability in, um, making that happen. And also the, the researcher who was doing that was a doc student driving this work, Shiloah Kiokowski, and she's at UAMS now. And anyway, she's still carrying on the collagen line, so that's, it's carried on in her lab now. Um, anyway, when we were looking at this, the joint pain angles we were looking at, the bottom line is over nine months of time, we had subjective improvements in joint pain

when you were in our study, but there were some caveats.

10 grams did better than 20.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Hmm.

Dr. Michael Ormsbee
Interesting. 10 grams did better than 20. And if we, when we dichotomized the amount of exercise you did, it was most helpful if you exercised for greater than 180 minutes per week of exercise. So with that said, it, in our hands, that was our outcome. 10 grams per day was the dose. Nine months was the timeline. We saw improvements in joint pain that were significant, and you had to exercise more than 180 minutes to feel those benefits. The cool relationship that we were, maybe should have expected but didn't, is they... We did some, uh, mood state assessments and such, and those people who had better knee pain actually had better improvements in mood, as you would expect, not in so much pain. Um, so yeah, that, that changed my, my tune on it because I was unsure of it entirely. Um, s- and then what we didn't measure, we, you know, always wish you had a better questionnaire or something, and people just talking to you after these studies, and they're like, "Changed my life."Some of them. Not all of them, but some of them were like, "This was amazing." I-- and I noticed that I came off of it for three months. Thing is, it takes a while. It's one of those things you have to take, and then they... We started seeing differences at around six months, and then they were sustained around nine months. So it took quite a while. Um, but it's enough that as a middle-aged athlete, uh, I've started implementing, uh, 10 grams a day. And we don't e- we-- in our study, we didn't even mix it with vitamin C, which is probably the-

Dr. Andy Galpin
Oh, really?

Dr. Michael Ormsbee
... which is the recommended way. Yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Like, all Keith Barr's work, you know-

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... is fascinating, and they're, they're the best at it. We were kinda late to the game and just wanted to have these joint pain outcomes s-specifically, 'cause there were evidence of it even in, um, y-young athletes, like college athletes-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... of fixing joint pain, and they didn't even have joint pain to begin with. Our people all had joint pain, but no diagnosed osteoarthritis.

Dr. Andy Galpin
Hmm.

Dr. Michael Ormsbee
And we still, we saw these benefits. But even in young people, it was shown. So I think the benefit is there. I would take it separately from whey. I would use whey for my muscle-building efforts. I would use collagen for my joint pain.

Dr. Andy Galpin
Okay. Handful of follow-ups on y- there. Uh, number one, for anyone at home, collagen can be got very cheaply. So in fact, I think Keith's initial stuff was just 50 cents at the store gelatin.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
Um, so you can look up... I'm sure we can probably put some stuff in the show notes, but you, you can literally make this stuff for very cheap. If you want, you can, of course, get it from a supplement company. Uh, most of them, I know the Momentous one is already made with vitamin C.

Dr. Michael Ormsbee
Mm.

Dr. Andy Galpin
Fifty milligrams is the general dosage, I think, for the activation. The reason for that, in case you're wondering, is a lot of... The quick way to explain this is the collagen needs to be actually absorbed and utilized, and vitamin C is an important cofactor in that process. So I skipped a bunch of science, and that's not totally correct what I said, but that, for the most part, if you're wondering like, "Why the heck did he say vitamin C?" if that felt out of-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... random for you,

© 2025 Perform Productions LLC

perhaps we can talk at a, a separate time about that. But that's, that's why you bring it up. And again, the collagen shots and other stuff from Momentous is already in there. But most other companies, if you have a different place that you like to get your supplements from,

a lot of them are mixing with vitamin C for that exact reason. So

I wanted to make sure we did that so I didn't forget, 'cause people are gonna ask, "Okay, where the heck do I get this stuff from?"

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
"And how do I get it there?" But back to your study design question. Did you do serial design or serial testing, or was it simply the six-month, nine-month mark that you did it? In other words-

Dr. Michael Ormsbee
No, they came in a lot. Yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Yeah. We were seeing them regularly month-monthly.

Dr. Andy Galpin
So you had your... And what all measures did you have there besides the joint pain, things like that?

Dr. Michael Ormsbee
The cognitive surveys.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And we, at the time, we were, we were doing body comp outcomes as well, obviously with the DEXA-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... and the bone, and then we also had, um, um,

© 2025 Perform Productions LLC

the actual, like, goniometer measures, but we had to basically throw it all away 'cause it was just useless at the end, unfortunately.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
So you saw virtually no change until about the six-month mark, and that was your first point of statistical difference was at that mark?

Dr. Michael Ormsbee
Yeah, not that clean, but roughly.

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
Yeah. Um, and-

Dr. Andy Galpin
And it held on for the nine months?

Dr. Michael Ormsbee
Yes. A- and again, in the people that exercise the most.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
So yeah. Uh, do I think it's the next thing? I don't know. It just seems to sway me a little bit that if joint pain's a problem for you, it'd be worth considering, but it isn't that expensive. It's very easy to take. Um, and it's, it's worth trying before you go and have surgery or something. You might as well give it a go.

Dr. Andy Galpin
Well, what are the known downsides besides cost?

Dr. Michael Ormsbee
Yeah, nothing. Yeah. Yeah. It's not gonna help build your muscle.

Dr. Andy Galpin
It won't help. Sure.

© 2025 Perform Productions LLC

But for a pretty reasonable-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... I don't know what, uh, I don't know, probably $40 a month, like maybe at the most?

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Something like that, um, relative to the pain you're experiencing, if it even has a-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... 10 or 15% reduction in pain. Do you remember what the magnitude of effect was on the pain?

Dr. Michael Ormsbee
Mm.

Dr. Andy Galpin
Was it something like that?

Dr. Michael Ormsbee
That's a good question. I don't remember.

Dr. Andy Galpin
I would imagine it's not this insane, life-changing, "My arthritis is gone my entire life," but it's probably more of like a-

Dr. Michael Ormsbee
No, the mean-

Dr. Andy Galpin
... "I went from a 7 out of 10 to 5 out of 10."

Dr. Michael Ormsbee
Yeah, the mean, the mean was a significant increase, but it wasn't mind-blowing. But you had those one-offs that were like, "My goodness."

Dr. Andy Galpin
Yeah.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
"That's, that's pretty cool to listen to." And, you know, that's not... It just drives more questions, you know?

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Now we wanna see what else could we do. We took a ton of blood, and we're still analyzing it, so we're trying to figure out some mechanisms behind it with some of the, um, like osteoblastic or osteoclastic activity, some of the things around collagen, um, synthesis and degradation. And so, um, Shiloah now, uh, is working on those outcomes from, from that sample. And then there's other things we're working on too and, and had some, uh, momentum for potentially use in recovery from surgery, like ACL repairs.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
And there, I think so-some work needs to be done in that space. Um, we have a real good relationship with, now with orthopedic medicine where I am, and then Shiloah works in a department that has that focus, so I think she'll be heading up a lot of those studies and be worth watching her, her, uh, profile grow here in the next couple years on that topic.

Dr. Andy Galpin
Okay. So we can assume very low downside,

l-likely plausible mild benefit. If that meets the criteria for you to take action, great.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
If it doesn't, that's fine too.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
All I'm assuming you want to do is just make sure people know what is possibly happening, and then it's up for them to decide if that meets their action criteria.

Dr. Michael Ormsbee
Yeah, no doubt about it. And I, I, I do think based on the data we have, if you're not exercising a

© 2025 Perform Productions LLC

lot, don't do it. Like, if you have knee pain-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... and you're not active, I wouldn't do it.

Dr. Andy Galpin
Last two questions on that. One, why do you think the ones that exercise the most are the only ones or the ones that saw the most benefit?

Dr. Michael Ormsbee
Hmm.

The, probably the most likely answer is blood flow.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
You get blood flow to the area, to areas that are hard to get blood flow to. Um, the other thing we didn't do was time, like purposely tell them when to take it in the day before exercise.

Dr. Andy Galpin
Interesting.

Dr. Michael Ormsbee
Whereas like Keith's work that shows a massive benefit-

Dr. Andy Galpin
Timing matters

Dr. Michael Ormsbee
... is when you take it before exercise-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... um, so that you have it in there when you're gonna get blood flow going. Um, we just split it morning and night so that we could do zero, zero, 5, 5-

Dr. Andy Galpin
I see

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... 10, 10 through the day. So those are some things that we could have done better.

Dr. Andy Galpin
So you need to repeat that study and specifically give it to them-In that 45 to 90 minutes pre-workout window, which is where most of these were

Dr. Michael Ormsbee
Yeah, it probably would be better to do a, a s-

Dr. Andy Galpin
So plausibly you could saw a bigger effect.

Dr. Michael Ormsbee
Sure. And if we did like a training study where we actually controlled the exercise to get them to the minutes we need, and then all these other factors. But I tell you, a nine-month study the way we did it-

Dr. Andy Galpin
Ooh

Dr. Michael Ormsbee
... which is pretty free living, still took four years. Um, and so if we redid it with all those other variables-

Dr. Andy Galpin
Wait. How'd I miss the math there?

That's science, right?

Dr. Michael Ormsbee
It is. I mean, you can't enroll everybody at once, so you trickle-

Dr. Andy Galpin
No

Dr. Michael Ormsbee
... them in, enroll them in, and because of that it takes years. Yeah.

Dr. Andy Galpin
Yeah. But you mention it's free living. That's gonna have the most ecological validity, the most-

Dr. Michael Ormsbee
Sure

© 2025 Perform Productions LLC

Dr. Andy Galpin
... external validity, right?

Dr. Michael Ormsbee
Sure.

Dr. Andy Galpin
The... What that means is that's the most realistic to a real-life scenario-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... where someone just, they're taking a scoop of it. They're not doing it the g- the best way. They're not having a perfectly designed training protocol, and you still see, in my opinion, as a, well, we'll just say fairly well-trained scientist at this point in my career, that's actually really powerful, because you didn't do it at the right time.

You didn't control for those things, and you still saw a statistically significant, albeit mild-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... benefit. I think most people listening would say, "I will take a mild reduction in my daily pain."

Dr. Michael Ormsbee
Yeah. Yeah. And, and I obviously-

Dr. Andy Galpin
For a

50 calorie-

Dr. Michael Ormsbee
Yeah, and the cognitive-

Dr. Andy Galpin
... snack

Dr. Michael Ormsbee
... side. Like, that's what was real nice, is like the, the sc- the sal- the scales and subscales were all showing, you know, if you had the improvement in pain, you started feeling better in all these other areas of your life.

© 2025 Perform Productions LLC

Dr. Andy Galpin
So the last question I have for you on that particular study was, and I know everyone listening has been waiting for me to ask this or hoping I would, how did 10

work better than 20?

Dr. Michael Ormsbee
Yeah. I, I'm not gonna have a great answer for you.

Dr. Andy Galpin
Ah.

Dr. Michael Ormsbee
Yeah. We, we don't really know. Um, it didn't make sense to us, and it's one of those-

Dr. Andy Galpin
Why did you even think to do 10 versus 20?

Dr. Michael Ormsbee
... conundrums. So a lot of times the dose on a prepackaged is 15.

Dr. Andy Galpin
Hmm.

Dr. Michael Ormsbee
And when we were looking at those data, there wasn't a lot in the space.

Um, and then we were talking with some of the companies that produce it, some saying that, that 20 was what they sell, but I'd seen efficacy at 10, and I thought, "Well, we should probably figure out what dose we should be taking."

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, and so that's why we designed it that way. Uh, but I don't know. Maybe 15 would've been the best, but we didn't do it. 0, 10, and 20. And 20 did some things, but the 10 just had kind of the most overall benefit, so that's what I would recommend at this point.

Dr. Andy Galpin
Right. Well, it's interesting because rarely with protein, and albeit collagen is not the same thing as whey protein,

I just can't think of too many situations in which when you go more than,

© 2025 Perform Productions LLC

you had a lesser effect. It's almost always the more protein or protein-like, the more amino acids, the more anything-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... in this space, either you get a benefit or you, at worst, get a s- maybe not a greater increase in benefit relative to the greater increase in, in substrate or volume or food or calories.

Dr. Michael Ormsbee
No doubt about it.

Dr. Andy Galpin
But in this case-

Dr. Michael Ormsbee
No

Dr. Andy Galpin
... you actually see a dampened effect.

Dr. Michael Ormsbee
Yeah, and I'll tell you, like, that's... We've been struggling with that for a while, and how do we interpret that and, um, you know, the reviewers had the same comments. It's like, I don't-

Dr. Andy Galpin
I'm sure that was qu- comment number one.

Dr. Michael Ormsbee
Yeah, I don't get it. So, you know, that, that particular paper tries to outline some of the potential reasons, but in reality we don't really know-

Dr. Andy Galpin
We think, yeah

Dr. Michael Ormsbee
... what happened.

Dr. Andy Galpin
Struggling to answer review questions.

Dr. Michael Ormsbee
Yeah.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
So we're, we're, we're not sure. Um, I think that's, you know, what to think.

Dr. Andy Galpin
It's honestly, no... Uh, and I don't mean this... I know you won't take it this way, but it's also very plausible it's artifact.

Dr. Michael Ormsbee
No doubt.

Dr. Andy Galpin
As in it might not be a real genuine finding. You... Weird things can happen, right? And this is why another thing you said earlier as a passing comment that I wanna pull out is another great sign of a phenomenal scientist. You mentioned a study coming from one lab before-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... and you say, "Okay."

You would say the same thing, I know you would, about your lab.

Dr. Michael Ormsbee
Oh, for sure.

Dr. Andy Galpin
So don't over-interpret this nine-month study.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Right? It's just like, well, let's see another lab repeat it. Let's do different circumstance and-

Dr. Michael Ormsbee
Yeah, without a doubt. Without a doubt. Yeah, I mean, that's the whole deal is, i- what's so exciting about the field of performance nutrition in general for me, it's not a dead science.

Dr. Andy Galpin
Mm.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
It evolves constantly, and that's what's great. It's like stuff I've taught five years ago is probably changing the way I teach it today and could change in another five years. And so, you know, taken as a whole, that like keeps us very interested and motivated, uh, uh, all the time.

Dr. Andy Galpin
Okay. Well, for the record, I'm gonna keep taking 20.

I don't care what your data say.

I'm not kidding. I'm not stopping it at all. It's, yeah, it's, it's too much of a potential win, but, um, I'll, I'll be honest, one of the major reasons I changed my position in this field was your paper. Once I saw your name, that kind of a study on, I was like, "Okay, now I can start believing this data." Because it's not against the other scientists who were publishing earlier than you, but it's just the fact that I now saw it on multiple labs-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... a lab I recognized, and the data were believable. And what I mean by that is when you do real-world studies, you rarely see everything works every time.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
It's like, well, maybe joint pain went down, but-

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
... they slept worse, or this marker in the blood went up and this other marker went up, but then this one didn't. We... And anytime I see a paper where like everything gets better-

Dr. Michael Ormsbee
Right

Dr. Andy Galpin
... I'm always like, "No."

Dr. Michael Ormsbee
Yeah, we don't-

© 2025 Perform Productions LLC

Dr. Andy Galpin
No way.

Dr. Michael Ormsbee
We don't suffer from that problem.

Dr. Andy Galpin
Awesome.

We've hit protein and carbohydrates, and we went to collagen. I think actually it would be helpful, and I'm sorry I forgot this, but maybe let's take a real quick step backwards. What the heck is collagen?

Dr. Michael Ormsbee
Hmm.

Dr. Andy Galpin
We hear about it a lot. We talk about it. I've, we've sort of been kind of saying it almost as, as this interchange with protein. It's not. But can you just give people a, a quick understanding of what collagen actually is?

Dr. Michael Ormsbee
Sure. Yeah. I mean, you could... You think of it as a protein. It's just got sort of different amino acids that make up its structure than you would a whey protein. So it's all kinds of, uh, amino acids linked together, but the biggest sort of magic to it, at least in the literature, is that it's, um, very high in proline-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... and glycine.And if you can get these cyclic proline molecules, hydroxyprolines out of the structure, that's what makes it different. Um, the, the whey protein, for example, is very high in leucine, whereas this is basically absent of leucine.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
And, and, and so that, there, that's why it's not a complete protein. It's kinda thought of as, thought for years like the rubbish sort of protein. Don't even use it. Throw it away.

Dr. Andy Galpin
Mm-hmm.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Um, but-

Dr. Andy Galpin
Leucine is the amino acid that's the primary driver... Well, it's a large driver of muscle growth, hence your comments earlier about whey protein being, "Hey, thanks Stu Phillips. Great. That's the one for muscle growth. This one-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... is basically absent of it."

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
And so-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... this is the throw-away protein, right?

Dr. Michael Ormsbee
Right. And, and, um, yeah, so

collagen in itself would be higher in these proline, hydroxyproline sort of linkages.

It's thought... I mean, there's data in animals showing that, um, as large of a, a nano peptide, so-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... nine amino acids are getting through intact.

That hasn't been shown in other places. Normally they all get... All the proteins will be sort of broken apart into individual amino acids and then brought in.

These are coming in in regularly in two to three amino acid structures, and then the largest I've seen is nine. And then there are then these certain patterns that are p- that supposedly are, are what can help to drive that to, um, uh, be a part of the matrix for like tendons and ligaments and,

© 2025 Perform Productions LLC

uh, that, that, the structural components that it's supposed to be used for.

Dr. Andy Galpin
Let me

make sure I understood that correctly. If you were to ingest majority of different types of proteins,

you're gonna have them go into your gut as that piece of steak,

that, uh, that milk, that yogurt, that whatever you're getting it from.

Great. It's gonna be in your stomach as a whole protein. By the time it gets into your blood, it is now in the blood, not as the whole protein anymore, but as its individual amino acid components, right? So this is what your gut and your digestive tract are doing, is they're breaking it down from the total protein into the amino acids. But what you're saying is what's unique about collagen is it not necessarily broken down the entire way.

Dr. Michael Ormsbee
Yeah. And I'm skeptical of it. I mean, I've read all the-

Dr. Andy Galpin
Theoretically.

Dr. Michael Ormsbee
I've s- I've read all the literature on it. We didn't measure the, the tripeptides and the, uh, bigger-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... molecules coming through. Although we had plans to, it kind of fell through unfortunately. Um-

Dr. Andy Galpin
Technical stuff, I'm sure.

Dr. Michael Ormsbee
Uh, y- yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um,

but that is what they're... The, the literature base is saying that that is what makes it novel and

© 2025 Perform Productions LLC

unique.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
So, uh, yeah.

Dr. Andy Galpin
So in your blood you could pull it out and you'll see two or three lin- these amino acids still linked together, which would be insanely uncommon. If you were to, for example, put a, an IV line in me and you measured my blood and I had a meal,

you could see how many, how much protein I ate, but you would have no idea what I actually ate. In this case it'd be different. You would, in theory, if this holds true, be able to say, "Wow, you specifically ate collagen."

Dr. Michael Ormsbee
Right. And I think the, where the, where the breakdown is-

Dr. Andy Galpin
This is very weird scientifically, by the way, if you're like, "What are these guys nerding about?" Like-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... I'm, I'm, I'm fixated on this 'cause this is really, really odd.

Dr. Michael Ormsbee
It, it is. And, and it's, it, it should make you a bit skeptical about it, 'cause some of the, some of the companies unfortunately are saying if you take this type, then, for example, like type one collagen or... It would go straight to tissues that need type one collagen. I've never seen that. I don't think that's actually the case. Um, to me it seems like those particular tissues are made up of, uh, certain types of amino acid chains. This particular type of protein has an abundance of those.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Um, and then if you can get it into the blood and then driven to the tissue that needs it, perhaps you'd see a benefit. There's a lot of ifs, ands, or buts in that statement.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Sure. Okay. So leucine is the one in a me- in, uh, most proteins that drives muscle protein synthesis. Over here, we're not talking about leucine. Um, we're talking about a couple of other ones. Remind us of what those other ones are and quickly why they matter.

Dr. Michael Ormsbee
Yeah. The components of, of collagen specifically that make it more unique 'cause of their pattern is really the, the, the serine, glycine, and, and proline. And the, those repeating structures create these like helical structures that can actually potentially do good for you.

Dr. Andy Galpin
Got it. Okay, great. So, um, I wanna focus a little bit more on one of those amino acids, 'cause I know you've done some work.

Tangentially, I'm, I'm transitioning here.

Dr. Michael Ormsbee
Okay.

Dr. Andy Galpin
I'm, I'm bridging a gap a little bit here, and that is glycine. So you don't need to give me the structural details here, but

we know why leucine matters. Why does glycine matter? What does it do? And then we'll get into some of your supplementation work here.

Dr. Michael Ormsbee
Yeah. So the, the context by which we used glycine was, uh, uh, with a product called betaine.

Dr. Andy Galpin
Betaine, also known as trimethylglycine.

Dr. Michael Ormsbee
trimethylglycine.

Dr. Andy Galpin
Or also known as betaine, betine, betaine. I've seen people mispronounce this.

Dr. Michael Ormsbee
Yeah. Yeah.

Dr. Andy Galpin
There's a thousand different ways. Sp- spelled, uh, B-E-A-T...

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
B-E-T-A-I-N-E. Yeah.

Dr. Andy Galpin
There you go.

Dr. Michael Ormsbee
Betaine.

Dr. Andy Galpin
B-E-T-A- yeah.

Dr. Michael Ormsbee
So what, the way we got started with betaine was we were, um... I had a student named Brandon Willingham who was interested in heat and thermo regulation, and so we were designing some studies for him to try to tease out some potential nutritional ways to affect hydration and thermo regulation. And, um, I was aware of betaine

a, a little bit, ba- mostly based from animal model research-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... that I had seen. So I shared those with Brandon and said, "You know, start diving into all this." And, um, he did a brilliant job in sort of coming up with, uh, various mechanisms by which betaine may be useful. And so the literature on betaine was quite fascinating to me, 'cause I don't typically read about sheep and cows and pigs.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
Um, but they were... These are... That's a standard product that's in the feed or the water supply of animals in hot humid conditions that need to survive. And there were data showing improved mortality in these animals that have betaine supplementation. And then I thought-

Dr. Andy Galpin
And this is probably, by the way, 10 years?

Dr. Michael Ormsbee
Oh, more than that.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
'Cause I know it's been on the-In our field published for, it's fairly recent, I guess is what I'm getting at.

Dr. Michael Ormsbee
Yeah, in our field, 10.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Yeah, ish.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Yeah, but the animal research was older. And, uh, so Brandon led a review paper that our group put out and just kind of describing why we think this might work and all this. And then he designed a really nice study that, uh, unfortunately, COVID times hit, and he was unable to-

Dr. Andy Galpin
Ooh

Dr. Michael Ormsbee
... do it. So we had to, um, design it where we didn't do any exercise. And so here's the thing. It... When the s- beta-alanine was in the product of the animals, they had good outcomes in, in the heat and survival.

The way it had been used in the one Thermoreg paper that was out there was in an acute dose. And so that was a mismatch to me. And so we said, "Well, why don't we try to load it just like you would creatine?"

Dr. Andy Galpin
So if I take this right before my heat exposure-

Dr. Michael Ormsbee
Yeah

© 2025 Perform Productions LLC

Dr. Andy Galpin
... potentially nothing's gonna happen.

Dr. Michael Ormsbee
Probably not gonna do anything. It d- in the, in the one study that existed, it, it didn't show anything. Um, a- and, and so I reached out to the authors of that paper, and I was discussing it with Doug Casa. We're trying to figure out kind of what went wrong, what went right, and, and everyone basically dismissed it 'cause it didn't do anything out of a really good lab.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, and so w- we said, "Well, let's look at it a little bit different. Let's try to load this." So we ended up giving it in the first study for just a week,

uh, of loading, and then we had to do passive heat exposure, which means you don't exercise or do anything. You just sit in a hot environment, which was 40 degrees Celsius in our, in our, um, thermal null chamber.

Dr. Andy Galpin
Okay, so you got participants sitting in there.

Dr. Michael Ormsbee
Yeah, they're just sitting in a chair in the heat.

Dr. Andy Galpin
At, at 40 degrees.

Dr. Michael Ormsbee
At 40 degrees C.

Dr. Andy Galpin
That's cooking.

Dr. Michael Ormsbee
Yeah, it's hot. It's hot, but it's not enough of a s-stress.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And so in that study, not surprisingly, we didn't show any benefits to doing passive heat exposure. So if you live in a hot environment, this isn't s- going to do anything for you. You need

© 2025 Perform Productions LLC

to start doing some work in that environment.

So then we were able to finally do the study that we had intended to w- after we got through with the COVID restrictions, and we started doing cycling in the heat. And so same design again. We decided to go ahead and, uh, load it for a week, and then we did, um, 70% VO2 max in the chamber, and we ch- turned the temperature to 33 degrees Celsius so that we could keep core temperature in a range that wouldn't eliminate us or make us end the study early.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, and we actually found some really cool results in that particular study. We're s- we're writing the study up now for publication, so it's, it's not out yet. Um-

Dr. Andy Galpin
So you can't tell us the results of that. You can tell us that it was pretty cool though.

Dr. Michael Ormsbee
It was. It was pretty cool, and it was enough to drive another study.

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
And, a- and then in the last one, we h- we're designed this study to be specifically in firefighters who are, um, prone to all kinds of heat issues, obviously. And, uh, again, we're, we're, we wrapped that study up. We're trying to publish that one s- sort of simultaneous here. And so in the next, hopefully, six months or so, we'll have both of these out and, uh, uh, another direction for people to start looking at this particular product for heat, Thermoreg.

Dr. Andy Galpin
Okay. I won't ask you about the results. That's faux pas, right? You can't tell us that until it comes out. But I, I can ask you some things about dosages and things like that. Before we do that, you were telling me earlier about a little bit of the protocol for the firefighter overheating. So that was not sit easy at 40 degrees.

Dr. Michael Ormsbee
No, yeah. Th- this-

Dr. Andy Galpin
What was that one?

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
This was live, and so, yeah, my whole study team was f-- well, they were phenomenal. They all went to the fire training grounds that are near to us. Um, and they were able to convince the fire chief and everybody to get on board, and they, they have a, a Conex box, like basically a large-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... cargo unit that they-

Dr. Andy Galpin
Shipping container.

Dr. Michael Ormsbee
Yeah, that they light on fire. They put bales of hay in there, and they light the thing on fire. And that's, uh, sometimes that's training in there, sometimes it's not. So we were able to do, um, a stair climb up and down several times and then go s- kneel in the Conex box that's, that's on fire. And then we had, uh, temperature gauges on the roof and on the, on the floor. So they were kneeling, but the floor temp, which like was outrageous. It was, it was cooking. And even on the bottom where they were kneeling, it was like being in an oven, you know, 500, 600 degrees.

Dr. Andy Galpin
It was

4,000-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... degrees on top?

Dr. Michael Ormsbee
The, the ceiling. Yeah, the ceiling height. So gets a little bit gnarly. Um-

Dr. Andy Galpin
Just a touch.

Dr. Michael Ormsbee
And they-

Dr. Andy Galpin
No longer impressed by your 200-degree sauna, by the way.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yeah. So they kneel in there. They had to kneel in there for 15 minutes, and even in just that amount of time, I mean, um, you're talking about 20 minutes losing a liter, liter and a half of water.

Dr. Andy Galpin
Yeah. Easy. I believe that.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
You get that hot, two, three pounds-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... gonna be gone.

Dr. Michael Ormsbee
Exactly.

Dr. Andy Galpin
So you...

The, the results will be what the results will be, but what you were looking at, in case this hasn't-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... been clear yet, is, is that supplement helping them manage the heat better?

Dr. Michael Ormsbee
Right. Right. So the supplement had data, which is why we went that direction, to, um,

uh, basically help a- as an osmolyte-

Dr. Andy Galpin
Mm

Dr. Michael Ormsbee
... and as a cellular hydration factor. So water follows it. It's in the cell, and perhaps it s- keeps your cell hydrated longer. It also has some properties that are published in other studies that

© 2025 Perform Productions LLC

show that it might protect proteins from degrading in hot temperatures. And so-

Dr. Andy Galpin
Denaturing, yeah.

Dr. Michael Ormsbee
Yeah, so the com- the, the combination of those two things, um, the increases in cellular volume, perhaps plasma volume, were intriguing enough for us to sort of go down this path for the last six years.

Dr. Andy Galpin
So how much... What's the dosage?

Dr. Michael Ormsbee
The original doses we were doing were 50 milligrams per kilogram body weight. We did it at relative. Um, and then by the time we started the firefighter study, the, the doc student who ran that, um, Lily Renteria, she,

um, kind of looked through everything that was relevant at that point, and we decided to give a standard three grams, um, for everybody, not based on k- not based on body weight for the firefighter study.

Dr. Andy Galpin
Yeah. Okay.

Dr. Michael Ormsbee
So three grams per day.

Dr. Andy Galpin
You mentioned really quickly there a couple of ways of how it could theoretically work. I know that this is early in the field. It's 10 years old at best. You got some publications you're working on. Surely others are.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
But outside of handling heat stress more effectively, can you think of any other known or plausible benefits of it as a supplement?

Dr. Michael Ormsbee
I mean, in our work, we were strictly looking at it for these. I know other people put it in as a hydration factor in various drinks.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
So, uh, like pre-workouts and such. It's, if you look at it it's-

Dr. Andy Galpin
It is available-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... in many, many supplements right now.

Dr. Michael Ormsbee
Yeah, it's already in many different things. In fact, um-Some of the products we were looking at, we had to find in a way that we could just get the raw ingredient-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... because it's just, it's mixed in everything. But yeah, it's usually in there. Sometimes it's like a filler, honestly.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
That's what it was used for. Um, and, and, uh-

Dr. Andy Galpin
Cheap. The cheap-

Dr. Michael Ormsbee
Yeah. And it looks like a new, nice shiny word to have on your label.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Uh, but I think it is possible that using it in this manner, um, could be helpful for those who are doing things in extreme heat.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
Uh, e- what I'm curious about is, is if it goes beyond these extreme, extreme examples, and maybe it would help even, like, migrant field workers, for example-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... and people who are doing labor in hot environments, and we're just, we're just not there yet.

Dr. Andy Galpin
Yeah. So in theory, if it could keep your core temperature lower, but enables you to have a higher sweat rate, there's lots of applications, or at least maintain your sweat wa- rate. You wonder if it has plausible benefit for endurance folks, not even extreme stuff, the ultra stuff, which could be the case.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
But even a soccer game in the heat. Um, a baseball game, probably not as much, but any real outdoor activity from a sporting perspective where you're gonna be in a lot of heat.

I don't know if there's any data on that, but it's plausible?

Dr. Michael Ormsbee
Yeah, I think that's where we're going. I mean, so we've done doing nothing-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... to doing cycling, to doing some things in a real applied setting with tactical athletes, these firefighters. Um, and if that story holds true, as I, I think it might, then I think we can go at the next phase-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... where it will be

© 2025 Perform Productions LLC

probably two aims. One would be, like, FEMA kind of w- work.

Dr. Andy Galpin
Oh, sure.

Dr. Michael Ormsbee
And then I think another one could be, like, the mig- migrant field worker side, and then I think we have a whole slew of work to do in athletics.

Dr. Andy Galpin
Wow. Awesome. That's a super interesting one. I have RSS alerts on my PubMed for that. I'm, like, looking for something to come out in that area, so I know I'll see your firefighter study the day that it hits there. Uh, maybe you can send me a reminder text, but I'll read it, no-

Dr. Michael Ormsbee
You got it.

Dr. Andy Galpin
... either way, man. Let's go from that to a- another similar sounding supplement that has, that you've done some work in, that people... Again, another, lots of out there, but people haven't heard about it, um, and that's teacrean or theacrine. Um, so tell us about that, what, what you've done in there, and maybe even just start us off by telling us what the heck it even is.

Dr. Michael Ormsbee
Yeah, so we got interested in that, um, teacrean,

uh, which is sort of the branded name of theacrine.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
Um-

Dr. Andy Galpin
So it's spelt, by the way, here as it's, like, one H versus the not-

Dr. Michael Ormsbee
Yes

Dr. Andy Galpin
... H in there, basically.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Very, very similar.

Dr. Andy Galpin
Like T, like T-E-A-

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
C-R-I-N-E.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Teacrine.

Dr. Michael Ormsbee
Teacrine. Uh, so a long, long time ago, I did some work in caffeine-

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... and ephedrine, when you could do it.

Dr. Andy Galpin
Oh, man, the days.

Dr. Michael Ormsbee
Yeah. This was the late '90s, and, and we were, uh, we were doing these different studies in metabolism and performance with these things. And so caffeine was always sort of an interest of mine. And then

teacrean came up as a, a possible caffeine mimetic that may-

Dr. Andy Galpin
Oh, yeah

Dr. Michael Ormsbee
... not have some of the known side effects of caffeine.

Dr. Andy Galpin
So can I take it and get the benefits but not have the crash, the jitters, the-

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yeah, they said the jitters specifically was sort of how it's-

Dr. Andy Galpin
Jitters specifically, right

Dr. Michael Ormsbee
... how it's marketed. And so we, uh, said, "Well, let's take a look," 'cause it was a product that we were interested. I had another student who was-

Dr. Andy Galpin
Man, if you're making supplements, you gotta be, you gotta block Mike- ... 'cause you can tell

he's on the hunt here.

Dr. Michael Ormsbee
Yeah, it's funny. We're, uh, we don't mean to. We're just trying to do what we can to put good work out there. Uh, but this particular one was interesting. We looked at, um, caffeine at, uh, 300 milligrams, um, teacrean-

Dr. Andy Galpin
For a known effective dose.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Not crazy high, but-

Dr. Michael Ormsbee
Not crazy high. And then we did, um, teacrean at 300, so we were matching them. And then we did a combo where we did 150 and 150 of each and a placebo. So there were four arms to it.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um,

i- in our hands, the people were well rested. They came in, they took the supplement, they waited 90 minutes, and then they did a whole bunch of tests, 1RMs, they did some rowing, they did all kinds of different physiological, you know, uh, battery of tests that they, that we were running them through. Um, and w- when we did this, the, uh, the most effective one we had of all of those was straight caffeine.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Mm.

Dr. Michael Ormsbee
It beat teacrean at 300. It beat the combo. It beat the placebo. Um, and the outcomes were specifically for perceived, um, uh, energy, uh, that they had for the event. It didn't actually change the weight they moved-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... or their time in anything. But they felt better doing it. They had more focus and motivation-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... to exercise with that dose. Now, I think where I've seen the literature go, and we didn't do this work, was more in recovering from perhaps, like, sleep deprivation-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... or cases where you're super run down, and then tasks that are more, uh, cognitive in nature, like marksmanship, uh, vigilance, you know, um, some cognitive skills. Um, that's where I've seen this sh- be shown more effective than the way that we designed it.

Dr. Andy Galpin
Yeah. So what you'd see in general with caffeine is you have a cognitive benefit. All right, people are aware of that. Alert, focused, so on and so forth. But there's a several decades of research on the physical performance benefit. So in general, endurance performance is enhanced and things like that. With teacrean, you saw m- many of the cognitive stuff, as you mentioned, but the physical stuff, uh, I actually, I don't think I've seen a single paper that's shown a physical benefit yet.

Dr. Michael Ormsbee
Mm-mm.

Dr. Andy Galpin
Maybe I've, I've-

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
No

Dr. Andy Galpin
... missed some, but none are there. So I've used it personally. Um, I know I'm not a huge

personal fan of caffeine, so teacrean was appealing in that sense. I don't really like stimulants in general, but,

eh.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Like, I didn't have a, a huge thing there. I have friends, though,

love it, completely love it.

Dr. Michael Ormsbee
Sure.

Dr. Andy Galpin
They've gone completely off caffeine and are pure teacrean. And, uh, I know other folks have put it in a mix, in combination, maybe 50 mgs of caffeine and 150 of teacrean-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... or something like that.Um, my answer to them is always like, if you feel great for those ones, if you're percept- amazing, I just don't anticipate too much performance benefit from it. Not exactly sure why. I don't know if you have any thoughts on why caffeine does it but tea cream doesn't.

Dr. Michael Ormsbee
Well, caffeine's always the sledgehammer.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Right? You see all these products, and it's touting this or that in it, but then you just look at the caffeine dose 'cause that's driving the response that you're probably feeling.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Five hundred mgs of caffeine.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
That you're feeling from it. So I don't... I'm not r- I'm not sure about, about that. In our hands, I think perhaps we, we could adjust the dosages and maybe try something different, but man, three hundred is pretty common dose, so.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And-

Dr. Andy Galpin
You start getting past that, you start getting in the negative. Like, there's a down slope with too much caffeine with performance.

Dr. Michael Ormsbee
Yeah. And I don't know about, you know, now, now that we understand, like, genetic responders to it and stuff, maybe there's something like that for tea cream as well. I don't know.

Dr. Andy Galpin
Yeah. We'll see. Okay, so we handled a couple of those ones. Um, I, I would love to get... I was hoping we'd get the chance to talk about some of the vascular work you've done in creatine, but maybe we'll save that for another day. Is there maybe... Yeah, you get, done a couple of papers or you've worked on some papers in that area, right? Can you give us a quick-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... maybe response to that?

Dr. Michael Ormsbee
So once again, looking at how, uh, clinical and sport performance nutrition cross over, creatine's a really good example of that. Um, we have some experts a- at FSU in vascular health and-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Mm

Dr. Michael Ormsbee
... um, blood flow dynamics and microvasculature. And so w- we were actually trying to put creatine through microdialysis probes and-

Dr. Andy Galpin
Oh, no kidding

Dr. Michael Ormsbee
... see if we could get it directly to the tissue we want. 'Cause you can put those in muscle as well.

Dr. Andy Galpin
Yeah, yeah, yeah.

Dr. Michael Ormsbee
Um-

Dr. Andy Galpin
That, that's how I'm familiar with it for the most part.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
So, so there were some interesting things we were thinking through. And so a PhD student that was in the program, Holly Clark, she wrote a nice review on the possibilities of it for-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... vascular health. So it's not the actual study.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Her dissertation was, and that's not published yet, but, um, the, the paper she wrote was all-

© 2025 Perform Productions LLC

Dr. Andy Galpin
You got me again

Dr. Michael Ormsbee
... all review. Yeah, yeah. So that one again is hopefully, uh, hopefully that one will be out here in the next couple months.

Dr. Andy Galpin
I had heard word on the street you were working on some vascular stuff with creatine, so I was hoping to pull that out of you, but okay. We'll have to use the review and the plausible mechanisms. I would be surprised if we don't see positive benefits there. Maybe not in your study, 'cause the study design or maybe it does, it doesn't.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
But ha- having gone through that paper, uh, and that's open access paper.

Dr. Michael Ormsbee
Yeah, yeah.

Dr. Andy Galpin
So anyone can go read that if you want.

Dr. Michael Ormsbee
Right now.

Dr. Andy Galpin
Um, I would, I would struggle to think that you guys are not, not onto something there. So oftentimes we talk about creatine. I've-

Dr. Michael Ormsbee
Mm

Dr. Andy Galpin
... been as staunch of a supporter as possible for the well-rounded benefits of creatine, but rarely have I seen people talk about the vascular benefits of that.

Dr. Michael Ormsbee
Yeah. More, you know, with creatine, it's funny, it's pretty ubiquitous now-

Dr. Andy Galpin
Yeah

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... but it's like, it's helping with so many different realms, and I think you would probably have a lot of folks say they don't even take it for performance anymore really. It's just a good side effect.

Dr. Andy Galpin
And by percentage-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... more people are taking it for non-performance-based things than they are.

Dr. Michael Ormsbee
It's just really cool. I mean, I think it's fascinating how it's going. I love seeing all the, the updates in that space and brain health and all these other benefits of it.

Dr. Andy Galpin
Isn't it wild? Man, when we were kids, people were having protein shakes before bed and taking creatine, and now thirty years later-

Dr. Michael Ormsbee
Now we know you shouldn't

Dr. Andy Galpin
... we're right back here. They all... See? Meatheads run the world, friends. It's not... It's, it's only bro science until it's real science. Okay.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Um, the reason I'm gonna cut you short on that one, I know you have more to say on that, is, is I actually wanna get to one more smaller, quicker question and then one more, uh, a couple more areas I think of interest. People are aware of prebiotics,

uh, but what are postbiotics?

Dr. Michael Ormsbee
You have these gut microbes that you can either feed with fuel or you can take what they produce, which would be a postbiotic.

Dr. Andy Galpin
Ah. So you have a prebiotic-

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
To feed them, and then you have a postbiotic, which is what they're producing.

Dr. Andy Galpin
And a probiotic would be?

Dr. Michael Ormsbee
Right. You have the actual food form of it.

Dr. Andy Galpin
There you go.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
So you have pre, post, and, uh, your mid here. So-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... what do we know about the postbiotics?

Dr. Michael Ormsbee
Yeah. So in our space, we're using this, um, to look at, again, gut health, something that's being produced. Um, the biggest one to date that we kinda know a lot about is, um, like butyrate.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
You know, that's one that's really common as a postbiotic. Um,

it's one of the ones we have the most generation of naturally.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
But it's also one that can be- go awry with different food issues, gut upset, different issues that could happen. And so we are, right now, one of my doctoral students is, um, going to be looking at a postbiotic that contains a, a butyrate, and then we're gonna look at gut health. We're looking at stool samples in this one. We're in a collaboration with this, um, great gut microbiome physiologist, Robbie Nagpal, who works with us.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah, Robbie Lab in your lab, right?

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
At the institute, right?

Dr. Michael Ormsbee
Yep.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Yep. And so Robbie's gonna help us with all of that, and then we're gonna be exercising in the heat for people who are unaccustomed to both exercise and exercise in the heat to try to disrupt the gut to see if we can do it. Um, and then there are some papers showing a, a link between butyrate and sleep, and so we're gonna see if there's any residual changes that are occurring in sleep. Um, and we're gonna do it as a time course so that we can, uh, f- take the supplement and then see when it shows up in the stool sample so that we know it's actually getting in there, which is a step that is, uh, easy to skip because it's harder to do-

Dr. Andy Galpin
Mm-hmm, yeah

Dr. Michael Ormsbee
... and it's expensive, but we're gonna make sure it's actually getting to where we want it to be getting.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, so if that doesn't work, then the part two of the study's a little bit disrupted. But-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... um, assuming it gets where it's gonna go and w- we'll have those answers, then we're gonna look at, um, a little bit of performance just 'cause, I don't... I always check performance.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Sure.

Dr. Michael Ormsbee
But, uh, mostly gut health and then some of the sleep dynamics.

Dr. Andy Galpin
Okay. Now, uh,

w- we should talk about that specifically. I... We, we can do some fun things in that area too.

Dr. Michael Ormsbee
Oh, good.

Dr. Andy Galpin
But have you thought at all yet, and you may not, that's okay, and you may not actually know it offhand, about how you're gonna be delivering that and the dosage of-Your postbiotic? I don't know if you guys have gotten to those details yet with your study design.

Dr. Michael Ormsbee
Yeah, we do, and I'm-

Dr. Andy Galpin
Or maybe your grad student probably knows.

Dr. Michael Ormsbee
Yeah. I, I don't remember the exact dosage that we're, that we're using in that one.

Dr. Andy Galpin
Okay. I'm sure you guys will get that figured out. There, there's gonna be another case though of you may have to tinker with a few types and styles and delivery formats and things like that, so you got another 15 years or so for that one.

Dr. Michael Ormsbee
Yeah, right. Got too many lanes going.

Dr. Andy Galpin
Yeah. No, I get it, man. That's pretty awesome.

Dr. Michael Ormsbee
The, the company that, that produces that product that we are asking for a grant f- from, it's actually a- already a product on the market.

Dr. Andy Galpin
Mm-hmm.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
It's called CoreBiome.

Dr. Andy Galpin
Okay.

Dr. Michael Ormsbee
Yeah. So that's the one we're gonna be using. So I don't remember the dose, but that's the product.

Dr. Andy Galpin
CoreBiome.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
Okay. Well, we'll see whether or not it works.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
So maybe we'll start taking it, maybe we won't. We know with your lab it's a 50/50 shot.

Dr. Michael Ormsbee
No doubt. No doubt.

Dr. Andy Galpin
Okay. I wanna get one more area here, and we're, we're staying in the lane of sports performance, but a paper that you published also, I'm pretty sure it was open access, that your group was a part of rather, um, "Supplementation for Muscle Damage and Recovery in Females."

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
I get this nonstop, but tell me what you guys found in that, and what do we know, what can we do for the, that population about supplements for... And, and, and I think it actually was specifically post-exercise muscle damage was-

Dr. Michael Ormsbee
Yeah

© 2025 Perform Productions LLC

Dr. Andy Galpin
... for the most part in that paper.

Dr. Michael Ormsbee
Yeah, so those were stemming from a series of, uh, muscle damage studies we were running, some in our lab, some were in collaboration with other, uh, universities. Um, that particular one was with, uh, Andrew McCune, who was in-

Dr. Andy Galpin
Mm

Dr. Michael Ormsbee
... South Africa, now is in Australia. Um, but we were, we had finished a male

version of that paper and that study.

Dr. Andy Galpin
Oh, I see how this went. Yeah.

Dr. Michael Ormsbee
Yes. And we wanted to, um, get more data. As you know, females in all research, but sports research, are severely underrepresented. And, uh, we're doing our best to, to move into that space as best we can, as, um, strategically as we can so that we get good data to come out of what we're looking at. Um, and, and so that was a, sort of a start years ago. That paper is probably 10 years old now, where, where we're-

Dr. Andy Galpin
Oh, wow

Dr. Michael Ormsbee
... going in and trying to get, um, just pull any data we could from data that had female athletes and did any kind of muscle damage structure, uh, i- in their design. Um, and it turns out in that particular paper, there wasn't all that much that was different. It was proper calories-

Dr. Andy Galpin
Uh-huh

Dr. Michael Ormsbee
... proper energy, proper carbohydrates, proper protein as well. So we were looking at sort of were there anything different. And then we started looking at things like creatine and, you know, what else might be in the mix. The, the unique part about that paper is we just designed it to look at every study that had women to date-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yep

Dr. Michael Ormsbee
... in a damage study. So that was, that was what was unique about that. And in our s- hands, um, we followed that with a couple of papers where we ran downhill at 10 or 15%, depending on the study, um, just to induce damage, and then we did that in men and women, and we're, we're trying to see, uh, if we could use some of these multi-ingredient performance supplements to fix anything.

Dr. Andy Galpin
And did any of them work?

Dr. Michael Ormsbee
No.

Dr. Andy Galpin
Oh.

Uh, with- without

ruining another supplement company's, uh, life there, what kind of multi-ingredients? Do you remember offhand the type of things that were in these? Or were these kind of creatine, beta-alanine, protein combination things? Is that what I mean?

Dr. Michael Ormsbee
You got it.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Yeah, exactly. Yeah, it was taking all the ones that you know work in- individually, and then you put them all together. And I, when I say no, I was being a little facetious.

Dr. Andy Galpin
I, I know. Yeah.

Dr. Michael Ormsbee
Like, the individual products will do something, but we're not just not seeing a robust enough response to say you're gonna mitigate this.

Dr. Andy Galpin
Yeah.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
You might, like, come back to normal a tad

better. I don't even want to say faster.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
Um, we were misquoted one time with, uh, someone pulled open a, when we used to read magazines, and like- ... pulled open a magazine and said, "You're in there. It says, uh, uh, you recovered, like, 300% faster." I'm like-

Dr. Andy Galpin
Oh, no

Dr. Michael Ormsbee
... "We don't even measure faster." Like, it wasn't even part of the design.

Dr. Andy Galpin
Oh, gosh.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Well, uh, if you think the misquoting was, uh, happening before, just wait-

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
... after this comes out. Just wait. Uh, anything we do know of that will enhance recovery? Maybe it was not from your paper or your research.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
But I'm, I'm, I'm actually most interested in knowing if there are things that are specifically more effective for females that we know of, or is that not the case?

Dr. Michael Ormsbee
Yeah, not yet. Not yet that I'm a- aware of.

© 2025 Perform Productions LLC

Dr. Andy Galpin
So no reason to think females need to do anything different from a nutrition or supplementation perspective?

Dr. Michael Ormsbee
Not at this point, but I'll tell you, like,

it's really hard to distinguish because you look at the research in females and female athletes, par- particularly, particularly around, like, menstrual cycle changes and throughout, um, the lifespan as well, and there's definitely things that could help with different life phases.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, and then there's some data that show, like, performance isn't really changed in the research that exists around the cycle, at least to date.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
But there's clearly a bunch of side effects or physiological effects that the women feel, and all the literature on exists-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... that could make you not want to perform-

Dr. Andy Galpin
Sure

Dr. Michael Ormsbee
... not want to go exercise. Um, and I don't, I think that's sort of being discounted a little bit in what I'm reading so far. So I don't know. I... There's a lot more work that has to be done there. If you look at it as black and white on a piece of paper, I don't think you can pinpoint one thing.

Dr. Andy Galpin
I see.

Dr. Michael Ormsbee
But I'm sure there are things that work for certain individuals and certain women that have a way

© 2025 Perform Productions LLC

to strategize their, their nutrition.

Dr. Andy Galpin
So as a general answer, probably not. At the specific level, though, there may be. We just don't have those data yet.

Dr. Michael Ormsbee
Yeah. I would even say there, there probably is. I just-

Dr. Andy Galpin
I'm not sure either.

Dr. Michael Ormsbee
Yeah. Mm-hmm.

Dr. Andy Galpin
We just need more work in that area. Amazing. You've been super generous with your time, but I'm not letting you off the hook before I get one more thing out of you. You, you were telling me about, um, some upcoming studies you've got going on.And you mentioned the travel one. I don't know if you can talk about that, but is there any other cool stuff-

Dr. Michael Ormsbee
Oh, yeah

Dr. Andy Galpin
... you got going on?

Dr. Michael Ormsbee
Yeah. So, uh, one of our doc students, um, Tim Grease, is much more straight sport performance, sports science.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Um, he spends a, an inordinate amount of time working with FSU athletics in different spaces now, um, about half time in, in there and then half time with us. Um, but he's interested in travel and the effects on sleep and also on performance. And so he's gonna, um, be able to travel with, uh, one of our women's teams-

Dr. Andy Galpin
Mm-hmm

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
... in the spring and take three different trips with the team, um, to... So we're in Florida, so an East Coast trip, and then w- he'll also do two West Coast trips all the way out here to California. And so he'll do one where they stay on, uh, East Coast time-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... and then one where they switch to West Coast time. Um, and so then he'll make... He'll have, uh, force plates he's bringing with him, so he's got force plate data, um, hand grip data, and then all the sleep metrics and a bunch of questionnaires that he'll be rolling through. So we can try to get a handle on, like, how does that work in a team setting and, and does it even make a difference?

Dr. Andy Galpin
We, uh, we did a, a jet lag travel study with, uh, Bill Kramer-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... at University of Connecticut. They did a bunch of stuff in stores. We took blood performance. They flew out to LA, did a whole bunch of other stuff, flew them back out there, retested them again. We did that probably 15 years ago or something like that, and that was a very fun study. So, uh, I'm looking forward to see what you guys pull up-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... and find in this one.

Dr. Michael Ormsbee
Yeah, me too. It's just that it's kind of a... It, it deals with things we're interested in and-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... um, but again, we got a, a, a student driving, driving the train on something that deals with human performance in an area that's relevant, and I think people will be interested in it.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Well, what's really interesting is if you follow college sports at all, you realize that a trip from Florida to California is now the same conference.

Dr. Michael Ormsbee
That's ACC.

Dr. Andy Galpin
That's ACC. We are now in the Big Ten. I'm like... My friend and I were... Actually, my brother-in-law, Josh, we were joking. He's an Ohio State guy, and, uh, he, he texted me something about University of Washington and USC just played in a classic Big Ten matchup. And I was just like, "Ah." Like, he's rubbing it in.

Dr. Michael Ormsbee
Yeah. It's all changing.

Dr. Andy Galpin
It's killing me. So this is a, this is a real part of collegiate athletics-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... and it's not just football.

Dr. Michael Ormsbee
Yeah. And-

Dr. Andy Galpin
All of them have to hop a flight

Dr. Michael Ormsbee
... the other thing is y- to consider is, like, they're, they're doing all of that and then having to maintain classes-

Dr. Andy Galpin
Oh, my gosh

Dr. Michael Ormsbee
... and then play again at home. And I think the stress on these student athletes is pretty tremendous that we don't often give them a lot of credit for, because you see them on TV or you're watching them play and it's like-

© 2025 Perform Productions LLC

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... oh, they just play. They don't need to go to class. But a lot of them do care about class, and it's, it's, uh, it's a big, big stress to do that kind of travel.

Dr. Andy Galpin
Folks that are paying attention are spending a lot of time, uh, at, at the collegiate level on sleep because of those things, and we expect them to go back and, and not, you know, make bad decisions and all that stuff-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... despite the fact that we know what happens, not only with lack of sleep, but just timing of sleep. Um, so really cool stuff. I'm gonna finish on one point, and I'm doing this intentionally at the end here

because I think it's really important.

There... A lot of people will talk about the current field of nutrition and supplementation and perhaps

the conflicts of interest and biases-

Dr. Michael Ormsbee
Mm

Dr. Andy Galpin
... and can you trust the research? With... And that's probably fair, right? The-

Dr. Michael Ormsbee
Mm-hmm

Dr. Andy Galpin
... general attitude is less trust in the institutions and perhaps has ever been, and that's fine.

But I really wanted to talk to you about this because I don't know necessarily anybody who has more industry funding. Uh, you have been, your studies have been paid for by supplement companies, and you have gotten money from the government, uh, NIH and, and plenty of other places. That said, as we have shown the entire conversation here,

© 2025 Perform Productions LLC

you're 50/50, right? Y- you clearly don't hesitate-

Dr. Michael Ormsbee
That's generous

Dr. Andy Galpin
... to take, to take funding from somebody and then tell them their product did not work.

Dr. Michael Ormsbee
Yeah. Yeah. I s- you see that so much, you know, especially with the rise of people bickering on social media and stuff, and it's, um,

in, at least in my world of academics, I can't even take a grant from a company that we don't get full rights to publish every single thing we find.

Dr. Andy Galpin
Those contracts don't happen anymore. Maybe that used to happen, but I don't know anyone who has contracts like that anymore.

Dr. Michael Ormsbee
Not at a big research university. I mean, they're, those are unfavorable terms. You cannot do that. Like, my job depends upon publishing,

and the university can't accept the money t- for me to administer the grant, you know, and, and carry it out if there's any terms that don't allow full rights to, to the data.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um, and so I think that's largely... I understand it, obviously. Um,

but in, in my experience, it's really hard to get these grants, especially with a reputation like ours, where it's like, I think they come to us because if it works, I think that it can be trusted.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Um,

and if it doesn't work, I'm gonna tell you it doesn't work. And then my goal would be that a company would take that in stride and say, "Well, let me improve it." It doesn't always work that way, and, you know, some relationships, I don't know, you, they just amicably end.

© 2025 Perform Productions LLC

Dr. Andy Galpin
Mm-hmm. Mm.

Dr. Michael Ormsbee
But, but, but, you know, really our goal is to just do the best work we possibly can, and then your intention of this question is good because

you can trust the data, but I think you also have to look at the lab and the university and the lead author and the corresponding author, and, like, you have to have sort of a s- a skill set to make sure that the data look great. And even then, you're not always 100% guaranteed for sure, 'cause there's biases that exist everywhere. But by and large, you can basically put to rest that someone's missing with all the data just to make sure that they publish what the company wants. I can't even take those grants at all.

Dr. Andy Galpin
Yeah. So

is it fair,

and I'm clearly asking this

in a directional way hereFor someone to pull up a study,

look at the conflict of interest statement, see that it's been funded by a company, and then immediately throw those data out, to immediately assume that this was biased and bought and paid for by the study. By my tone, you can clearly see my position there.

Dr. Michael Ormsbee
Yeah. Yeah. Not, not at all. Uh, that is not f- that is not fair. Um, I mean, some of the best work that exists would never come... And if you want answers about these supplement questions-

Dr. Andy Galpin
Every study you've ever done

Dr. Michael Ormsbee
... somebody has to do it and someone has to fund it. They're expensive.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And

you're not gonna get some of this kind of funding unless there's a disease state from some of the

© 2025 Perform Productions LLC

federal agencies.

Dr. Andy Galpin
Right.

Dr. Michael Ormsbee
And even then it's harder to get i- in that realm. Um, and so if you want those data, you have to get it from a company that has something that is invested in it. They make the product, they want to produce the product.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And the best examples that I've been a part of, people have approached you early before something's designed, and that's rare.

Dr. Andy Galpin
Mm-hmm.

Dr. Michael Ormsbee
Most times it exists already, and then they make enough money to then fund research, so then they can try it. Um, and then in some cases, these companies, um, do really well. Sometimes they'll fold, sometimes they change their marketing strategy, um, sometimes they'll change a dosing strategy.

Dr. Andy Galpin
I think what would be really helpful would be saying, when you look at papers and you see that it's been funded by a supplement company, y- I know you're gonna look at the lab, and you'll know the people on there, and you'll know the students and the faculty and the institution.

It makes it easy for people like you and I to quickly vet that. So I can look at things and go, "Yeah, I'm, I'm not believing that yet." I see it's funded by the company. Okay, one of the co-authors works at the company, and I don't recognize that lab. Doesn't mean it's wrong or fake at all, but I'm gonna have much more hesitation.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
For people that don't know labs, they don't know who you are. I've, you know-

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Yep

Dr. Andy Galpin
... the, one of the most dedicated or, uh, published prolific people in this area. They don't know the labs. Are there anything you can give them to help? Because it is also real. If you see... There is people who are straight up fraudulent in data. There are people who have made studies up.

Dr. Michael Ormsbee
No doubt.

Dr. Andy Galpin
Uh, I use, actually, I don't know, I'm not familiar with Retraction Watch.

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
It's great. It's a great place where you can see papers that are retracted. Awesome service.

So that stuff does happen. It's not really common.

Dr. Michael Ormsbee
But it gets the headlines.

Dr. Andy Galpin
But it gets the headlines, right?

Dr. Michael Ormsbee
Yeah, it makes people scared.

Dr. Andy Galpin
So it's true.

When I personally see a study that's been funded by a certain... Okay, like I'm notching it in my brain as datum.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
That's an important datum.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Mm-hmm.

Dr. Andy Galpin
Doesn't mean anything, but it is a nice little datum. Any advice for people that are trying to navigate that? Because we don't want them looking at papers, not looking at conflicts of interest at all, or not looking at potential funding sources. We want them to. That's good. But how do they not overreact, uh, as well?

Dr. Michael Ormsbee
Yeah. Yeah, I think there's two approaches to it. Um, I actually don't know a ton of people who would be searching PubMed like you or I might for these papers. And so if you're looking at a whole, like, a product, then I would look at how the product's tested or the label, you know, the third-party testing that exists-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... for some of the actual supplements. Um, you probably have covered some of that before. It's like, it's, it's an interesting place to be, and you-

Dr. Andy Galpin
Yeah

Dr. Michael Ormsbee
... y- the companies have to do a ton of work to get those certifications, particularly for sport. Um-

Dr. Andy Galpin
Certified for Sport, Informed Choice-

Dr. Michael Ormsbee
NSF

Dr. Andy Galpin
... NSF.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Uh, be it, those are really expensive and really hard.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
Really expensive. And, and there's different uses for them, and so people can, um, say what they want sort of about the back and forth, but those are what currently are trusted, and they're the ones that are getting into, like, universities-

Dr. Andy Galpin
Sure

Dr. Michael Ormsbee
... and these other things.

Dr. Andy Galpin
Yep.

Dr. Michael Ormsbee
So, so that's an important sort of distinction. Um,

a- an easy way is some resources like examine.com-

Dr. Andy Galpin
Mm-hmm

Dr. Michael Ormsbee
... where people can look up the individual ingredients, see what other, uh, um, papers have been published on it. They get sort of a gra- a grade on it. And then if you're actually reading the paper, I think you're gonna have to then say, "Okay, who wrote that paper?" And just search that person's name again and see if you can come up with any other things that you're seeing as a pattern in that space. Um-

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
Yeah.

Dr. Andy Galpin
Okay. So fair enough to say those things are important to pay attention to, but on its surface doesn't immediately throw out-

Dr. Michael Ormsbee
100%

Dr. Andy Galpin
... results.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
I mean, yeah, the... If you want these things to be researched, we need funding sources.

Dr. Andy Galpin
Yeah.

Dr. Michael Ormsbee
And if it wants to be 100 peren- percent independent, then please ping our research account, because we can run those studies.

Dr. Andy Galpin
Yeah, any philanthropic donor out there that wants to pay for all these things.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Uh, Mike has, uh, an account that you can send all $300 million to.

Dr. Michael Ormsbee
Right.

Dr. Andy Galpin
Yeah. Amazing, man. Uh, anything else you feel like we've missed from earlier that you're gonna go back and say, or any other awesome stuff you want to share with people?

Dr. Michael Ormsbee
No, man, I think we, we covered quite a lot. I, I, I, uh, I hope we didn't get sort of lost in the weeds on some of it, but for me it's really important to share that you can have a pretty fulfilling career and fulfilling life doing what you love to do. Um, and you just have to find the right outlet for it, you know? And that's sort of the passion we're trying to share with all of this is, um, how can we sort of get human performance to a place that is mainstream, and how can we answer these questions that people ask? And, uh, I, I hope that if anything from this you can kind of see that the work we're putting out there is, um, I hope, gonna lead sort of the change in that, in that sort of mindset and shift on how we view these types of studies.

Dr. Andy Galpin
Yeah. I, I'm, I'm sure that will have the impact. I, I can tell just by the way that you've talked today, uh, you didn't have a direct path to your career. You bounced around a little bit, and I know you toyed with industry for a while and did some other things, and it's not always necessarily this you woke up when you, one day when you were 12 and realized you wanted to become a sports scientist.

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
No, did not happen that way.

Dr. Andy Galpin
A dietician, whatever else. Um, but the, the way that you educate, I know that, as I've mentioned a couple times now, and I've seen you speak at multiple events, you're a phenomenal educator. Uh, you've earned many awards in those areas. You have courses?That are available for people?

Dr. Michael Ormsbee
Yes.

Dr. Andy Galpin
That they-- To tell us about that.

Dr. Michael Ormsbee
Yeah. So we had a venture a while back to, to, uh, create basically an academic course, but for everyday people. It's, uh, twenty-four thirty-minute lectures. It was put out by a company called The Great Courses at the time. Got picked up by Wondrium.

Dr. Andy Galpin
Mm. Nice.

Dr. Michael Ormsbee
Um, but that's-- it's-- if you're, like, interested in a classroom kind of a setting, that's, that's what it is. It's, it's designed for everyday people, but everything you wanna know about, um... It's called Changing Body Composition Through Diet and Exercise, so it's not all that

sexy of a title, but it, it-

Dr. Andy Galpin
Pretty direct, though

Dr. Michael Ormsbee
... it, it tells you what you're gonna get.

Dr. Andy Galpin
Yeah. And so that's available. Anyone can go take that?

Dr. Michael Ormsbee
Yes. Yeah. That's, uh-

Dr. Andy Galpin
Don't have to be enrolled in Florida State University or anything like that?

© 2025 Perform Productions LLC

Dr. Michael Ormsbee
No, no. That's, like, on Amazon and other places, yeah.

Dr. Andy Galpin
Yep, and they can Google that around and find that. We'll have show links in the show notes-

Dr. Michael Ormsbee
Yeah. Yeah, that'd be great

Dr. Andy Galpin
... of course, to all those things over there. I mentioned it earlier, but please tell them how they can come to your lab,

uh, offering metabolic testing and body composition, how all that works-

Dr. Michael Ormsbee
Yeah

Dr. Andy Galpin
... and where do they go.

Dr. Michael Ormsbee
So our, our pay-for-testing service is basically anybody can have access to the research-grade equipment that we use. It's a sort of a win-win for everybody. You get a great experience in our, in our institute. Um, the equipment stays continually used, which is how it works better than worse. Uh, the service fees, as Andy mentioned, are reasonable. Um, and so that's just all through our website.

Dr. Andy Galpin
I think I looked, and it was, like, fifty dollars for some of the testing. Seventy-five doll- Like, very, very, very reasonable.

Dr. Michael Ormsbee
It is. It's quite reasonable, and they give great packages, and I-- we have a outreach director, Kieran Patterson, now who's running that part of it, and we have, uh, students involved, so you give everyone kind of a good experience.

Dr. Andy Galpin
Oh, right.

Dr. Michael Ormsbee
Yeah, and it's just, it's just great. We, we have even have, like, dietary counseling and services like that that are available, so a lot of the-- I tell you, it's everybody. We've had fourteen-year-old athletes that are on their way up to Olympic caliber to seventy-five-year-old individuals who

© 2025 Perform Productions LLC

heard they should add a little bit of muscle. Um, and so everyone in between is sort of, um, showing up to see what we've got over there. It's a, it's a good spot.

Dr. Andy Galpin
And where do they find that? Where do they go to see that and...?

Dr. Michael Ormsbee
That's just on the website for the lab, which is issm, uh, .fsu.edu.

Dr. Andy Galpin
Gotcha. Okay. And again, we'll have links to, to all that stuff. Man, I can't appreciate and, and thank you enough for coming all the way out here. I appreciate the time. I appreciate you've-- everything you've done in the field and how much you've shared, uh, with us here today. I know that there's a ton of useful information here. I know that you shared a bunch of information that most people have never heard before or is counter to what they thought they knew, and I think we're gonna hear plenty of stories of success after this, so thank you so much, man.

Dr. Michael Ormsbee
You're welcome, Andy. Appreciate it.

Dr. Andy Galpin
Thank you for joining today's episode with Dr. Mike Ormsbee. If you'd like to learn more about Mike's work or you're interested in supporting his research at Florida State, please see the links in our show notes. Right now, Mike and his lab have a dollar-to-dollar match going, so anyone who makes contributions will have it matched up to fifty thousand dollars, an excellent opportunity to support high-quality and helpful research. Mike also has educational courses that anyone in the world can take, as well as social media, so you can follow him there on Instagram and Twitter as great places to learn more and keep up to date with the work he's doing and his institute. Thank you for joining for today's episode. My goal, as always, is to share exciting scientific insights that help you perform at your best. If the show resonates with you and you wanna help ensure this information remains free and accessible to anyone in the world, there are a few ways that you can support. First, you can subscribe to the show on YouTube, Spotify, and Apple, and on Apple and Spotify, you can leave us up to a five-star review. Subscribing and leaving a review really does help us a lot. Also, please check out our sponsors. The show would not exist without them and their exceptional products and services. Finally, you can share today's episode with a friend who you think would enjoy it. If you have any content questions or suggestions, please put those in the comments section on YouTube. I really do try my best to read them all and to see what you have to say. I use my Instagram and X profiles also exclusively for scientific communication, so those are great places to follow along for more learning. My handle is @drandygalpin on both platforms. We also have an email newsletter that

© 2025 Perform Productions LLC

distills all of our episodes into the most actionable takeaways. We have newsletters on how to improve fitness and VO2 max, how to build muscle and strength, and much more. To subscribe to the newsletter, just go to performpodcast.com and click Newsletter. It's completely free, and we do not share your email with anybody. Thank you for listening, and never forget, in the famous words of Bill Bowerman, "If you have a body, you are an athlete."

© 2025 Perform Productions LLC