DANNY LENNON: Jackson, thanks for coming on the podcast.

JACKSON PEOS: It's a pleasure, man. I've been listening for a long, long time.

DANNY LENNON: Yeah. We've had a chance to hang out a few times now and you've kindly showed me the lab at UWA, as well. And you've got a massive trial going on at the moment, which we'll definitely circle back to, but just kind of briefly give people an introduction to who you are, where you are right now, and any of that stuff that's relevant to today's conversation.

JACKSON PEOS: Sure. So, I am a PhD candidate at the University of Western Australia working out of the School of Human Sciences. Now, my research focuses on something known as intermittent energy restriction. Now, whenever we're looking at weight loss, we sort of have two pathways that we can go down. We have our traditional approach, which is known as continuous energy restriction. Now all that means is sort of the person who's in a caloric deficit for every day of the duration of the weight loss phase. Now if we contrast that to some of the dietary protocols I'm researching at the moment, which is our intermittent side of things, so an intermittent diet is just a dietary protocol that alternates a period of dieting with a period of higher feeding.

Now, when we're talking about higher feeding, we have two sort of broad methods that are mostly used in practice. On one side we have the refeeds method and the other side we have a diet break method. Now these terms can be a little bit confusing for some people because they're often used interchangeably. The best way we can sort of define the two is by referring to the refeeds as sort of a 24 to 48 hour increase in calories that alternates with a period of dieting and a diet break being something a little bit longer. So, sort of, at least three days, sometimes up to two weeks. So, it's still quite a broad range. We don't have very sort of narrow boundaries on how we're sort of defining these sorts of terms. We just know that sort of ... that with these protocols we're increasing calories for sort of a certain period of time. It can be short. It can be long. And that's always going to alternate with a period of sort of deficits. So, it's sort of a nonstructural approach to sort of weight loss where you're sort of lifting calories up and down. And that's sort of what my research focuses on at the moment.

DANNY LENNON: Right. And there's obviously, like you said, a lot of work that is being done and needs to be done in these areas to really elucidate what potential benefits they may have. But, at least from a mechanistic point of view, this has been talked about for a while or suggested it may have benefits. And that's what led to people trialing this in practice. So, what are some of the primary reasons that people may give as hypotheses for why it may be beneficial over just a continuous linear diet?

JACKSON PEOS: Absolutely. So, especially in fitness circles, refeeds and diet breaks are very prevalent. And now, we have a strong anecdotal support and we have a lot of good case studies and we sort of ... there's a lot of positive reports coming from both coaches at the high level and high level athletes sort of vouching for the efficacy of sort of refeeds and diet breaks in sort of a weight loss protocol. Now, in terms of scientific trials, that's sort of where we're lacking a bit. So, I'll just take

you back to a study that was published in 2017. Now, they took a bunch of bodybuilders and they asked them about some of the sort of weight loss practices that they were trialing. And one of the common ones referred to by these athletes were refeeds. So ... and they asked the athletes. They said, "Okay, so why do you do these refeeds? What are some of the potential benefits that you think you're getting from these things?" Now, the athletes talked about sort of replenishing muscle glycogen, which is just a salt form of carbohydrate in the muscle. Talking about mental refreshment. Talking about preventing reductions in energy expenditure. Now, that's all great, but it's just subjective reporting. It's not very high ... it's not high-grade level evidence. Now we know that we have sort of a theoretical rationale for why these sorts of things could have benefit. But what we really care about, like I said, is the scientific trials. Now, it would be great to study these things in athletes, but the problem with athlete dieting studies is it's very difficult to get funding to test these sorts of things. And that's why we have a disparity between dieting research done on sort of lean athletic populations versus overweight, obese people because we have these massive obesity foundations and overweight obesity foundations that provide massive amounts of money that they can run these studies. Now, in terms of sort of going back to the theoretical rationale of sort of why an athlete might even be considering doing sort of a refeed and diet break in the first place. When we go in a caloric deficit, when we begin a weight loss phase, we know that the caloric level that we start the diet on is only really effective for a short period of time before our body adjusts to it. Now, we know that our body likes to hang around at a set point body fat level or body weight, and that's just cause our body likes homeostasis. Now, when we push body weight or body fat below that, the body starts fighting back and it starts fighting back in a number of ways. And we refer to this pushback as adaptive responses to energy restriction. Now, there's sort of two broad components of this. There's a whole host of changes that we get

that accompany weight loss, but the two broad ones are, we see changes in sort of metabolism and changes in hormones that regulate our appetite. Now when we start a dieting phase, when I'm talking about changes in metabolism, we're talking about reductions in energy expenditure or slowdown of our metabolic rate if we want to be a little bit less accurate. Now, what this means is when ... let's say we had a caloric deficit of 400 at the starting of a diet phase, as we progressively move through dieting weeks and metabolism starts with just this caloric level and it adjusts by burning less calories at rest and burning less calories during activity. So, what this means is that now we're at week four on the same level of calories that we were at week one, but the caloric deficit is now narrowed. It's got much more smaller. Now, what this means is that progressively future weight loss gets more and more difficult. So, that's one challenge that we face with sort of energy restriction. The other broad challenge we face is sort of these changes in hormones that regulate our appetite. So, the key ones that we often refer to is leptin, ghrelin and PYY. These things change in combination as we lose weight that cause us to get less satiated from our meals and more hungrier. Now what this means is sort of as we progress through a diet phase or through a weight loss phase, our bodies giving us these persistent drives to eat more food, to bring us back closer to our set point body fat or body weight level. And when this happens, sort of adherence to the caloric level, sort of the caloric amount that you're supposed to have becomes more and more difficult. Now the rationale behind intermittent energy restriction comes from research that shows when you take someone in a diet who's been on ... lost an amount of weight, been in a caloric deficit for some period of time and you take them into energy balance, which means give them enough calories to maintain their body weight. When you establish energy balance, you start getting restoration of some of these metabolic and hormonal changes that are making weight loss more difficult. So the theory behind sort of

intermittent dieting is that, okay, well, if we give someone these short term bouts of energy balance, these short term bouts of increasing calories, could this sort of restore some of the metabolic downregulation and sort of restore some of our sort of appetite hormones that's gonna therefore lead to sort of better sort of weight loss outcomes in the future. Now we're not a hundred percent sure of this. Like the classic one is we hear about sort of the bodybuilders having these cheat days sort of as a metabolic boost. Now all that's saying is that sort of this influx of calories, which could be from a cheat day, refeed or a diet break is sort of triggering this normalization of resting energy expenditure. Now, if that was indeed the case, it would actually allow weight loss to be more efficient because the more calories that we're burning through the day essentially means that we could eat more calories to lose a given amount of weight loss or lose more weight on a given amount of calories. So, it makes weight loss more efficient if that was indeed the case that we were giving restoration of energy expenditure from these higher feeding periods. The other theories that ... the classic one is this talking about this leptin signaling and it's ... we know that when someone goes through a dieting phase and they're losing amounts of weight, so leptin is a hormone primarily released from fat cells and as fat cells decrease in size, they secrete less leptin. Now when leptin levels decrease in the blood, we get a decrease in energy expenditure, which is again a problem because it means we're burning less calories. It makes ... it's going to mean that we have to take our calories lower and lower to get a certain amount of weight loss. And the other problem with leptin is when it gets low, because leptin's a potent satiety hormone, when the levels decrease in the blood, we actually get a whole lot more hungry, which again makes sort of managing the diet or adhering to the diet a whole lot more difficult. Now, the rationale behind sort of refeeds, diet breaks and leptin is that some research initially came out about four years ago. And it showed where you overfeed

someone on calories, you actually get a trigger of leptin release. So, this short-term boost in leptin levels and when this happens, it translated to an increase ... a 7% increase in total daily energy expenditure. So, the people burned 7% more calories than they normally would throughout a day. Now, a lot of researchers got hold of this and it sort of trickled down into the fitness circles and they saw this state and they thought: Right, well, if we take our athletes who are dieting down and we give them some sort of an influx of calories, a short term bout of energy balance, may that mean that leptin gets sort of triggered short term and it can potentially normalize or store leptin sort of closer to baseline values and then it's going to therefore translate to sort of better maintenance of energy expenditure and sort of more normal appetite levels. So, that was sort of the rationale of leptin. But the problem with these leptin studies is they're predicated on overfeeding studies. Now typically with refeeds and diet breaks, what we advise is to feed the person enough calories to maintain their body weight, not overfeed, not a caloric surplus. So, we're actually unsure whether leptin would be triggered in a significant or meaningful way just from sort of a weight maintenance period or increase in calories, but only enough to maintain body weight. So, there's a couple of the true broad rationale behind why intermittent diets could be beneficial. But I'll touch on a couple more that sort of I think do have relevance and one is this idea behind muscle glycogen and performance. Now we know that as someone diet's down, we get a sort of a graduate depletion of their muscle glycogen stores. Like I said, it's just a stored form of carbohydrate and muscle. Now when we look at the research and we compare athletes performing in both the strength and endurance capacity and we compare them performing with a low glycogen saturation versus a high glycogen saturation ... when glycogen saturation is low, typically strength and endurance performance is impaired. Now the theory in the context of glycogen is that by giving someone a refeed or diet break, which is predominant ... which is

going to at least involve some increasing carbohydrate, it's going to potentially give a short term sort of filling up of muscle glycogen stores or sort of, yeah, this refilling notion. And when glycogen sort of refilled a little bit more, that athlete's going to potentially perform better, train better, and this could potentially also lead to sort of some better sort of weight loss outcomes and more maintenance of lean mass and things like that. So, there's certainly a rationale deriving from sort of maintaining glycogen levels at a higher degree throughout the weight loss phase. But again, the problem that we have here is we're not sure sort of if we give an athlete a refeed or a diet break, how long does glycogen stay saturated for? How long does it stay up for? Because if it only translated to sort of one day of improved training, it's uncertain if that would translate to a significantly or practical difference in performance after 12 weeks of dieting or something like that. So, we've got a little bit more research to do there. But there's certainly a decent rationale through that pathway as well. And as a final one I'll touch on is ... so that was sort of focused mainly on the physiological components of why intermittent diets might have merit. But it's also worth mentioning that intermittent diets could have a potent psychological edge over continuous diets. Now we know that when you take anyone and you give them a 12 week or you put them on a 12-week dieting phase or even an eight-week dieting phase, that can be very daunting for a lot of people. And this is a key ... when I say eight- or 12-week dieting phase, I'm talking about a traditional continuous start. So, they're in a caloric deficit for every day of this intervention. Now when you put someone on an intervention like that, it's highly likely that by week four, they're probably going to notice impairments to their energy levels. Their mood is probably going to be slightly compromised. And the appetite certainly going to be taking sort of a hit that's going to be sort of pushing them in a direction to eat more. Now, if they're feeling a little bit crappy by week four and they've got four deficit weeks in front of them, sometimes

this can be overwhelming for the person. And it can cause ... and its sort of a recipe for poor dietary control. And sometimes it can result in sort of the athlete or the diet of falling off the wagon because they just think: Oh, this is just too hard. This is too long. I can't hang on like this. Now, if we contrast that to an intermittent diet, which we break up the dieting phase into sort of dieting blocks and sort of higher feeding blocks. Sorry. So, this can be with a refeed or a diet break. So, let's say with a model that I'm testing currently at the moment, which alternates three weeks of dieting with a one-week diet break. Now let's say that we also gave someone in an intermittent diet, 12 weeks of dieting that they had to complete. But after every three weeks they got a one-week diet break. Now, even if they're feeling pretty crap by maybe the start of week three, they might just be able to go: Well, I've only got seven deficit days ahead of me; I can probably hang on here because I know that I've got an increase in calories coming sort of at the end of the week. It's going to make me feel a little bit better on my trainings. It's going to improve a little bit better and things like that. Whereas if we look on the other side of the coin with the continuous diet dieter at his week three, he's got nine long dieting weeks sort of in front of him. And I think that can be a recipe for at least sort of adherence issues. Now that's sort of one side of the psychological component. But I think we should also talk about how ... it sort of depends a little bit how your refeed or diet break is set up. But certainly it ... let's say we had a bodybuilder sort of in a contest prep. Now, let's say that he was going to do a double day refeed at the end of the week. So, he would do five deficit days and then Saturday and Sunday he would have an increase in calories to sort of weight maintenance. Now it wouldn't be a massive ... this is not cheat day, this is nothing like that. This might translate to maybe a 400 or 500 calorie increase on these days. Now it's not drastic, but it's enough that they might be able to go out for a meal with family or friends or something like that. And it might just ... it might feel them, they're less

socially isolated. It might feel they're not so constantly deprived from both sort of food and from sort of social events and sort of social interactions. And it could just lead to sort of the overall dieting phase being a little bit more enjoyable for them. So, all in all, that's sort of the physiological and psychological rationale for why we might think intermittent diets could have benefit over your traditional continuous diet.

DANNY LENNON: Right. So there seems to be those like different kind of subgroups of benefits that are kind of related, but also kind of separate in that you said that there's these physiological things that we can see can directly maybe influence energy expenditure. At least that's what we're kind of checking. Then there's other physiological changes that may impact your drive to consume more calories and appetite and so on, which again gets into things like adherence or in a free-living situation, how likely someone's going to overconsume. And then these kinds of psychological issues that again, more sub components within that, and so it seems that we're in a place where first we need to check physiologically or practically: Is there something directly influencing energy balance here? But there's also this interesting dynamic of even in cases where we might not see that, it doesn't mean there's no pragmatic benefit to it, which we might get to.

JACKSON PEOS: Absolutely.

DANNY LENNON: And so, there's a lot of questions that are kind of still open, that are interesting to explore, and we'll definitely get to that. But first what I wanted to ask about, cause I know you've touched on this previously, and it's probably good to clear up for people too, is that when we're talking about this intermittent caloric restriction that can obviously be used for a whole bunch of different setups, right? And one of the places where you typically see an intermittent restriction is in intermittent fasting models. Because to some degree you're having

higher intakes or more a baseline intake and then very low-calorie days, like for a five two diet or alternate day fasting, which you mentioned today. With that, do you think that is a distinctly different kind of form of intermittent restriction when you get calories so low on those fasting days as a compared to a certain set deficit where you're just gradually bringing back up to maintenance on a certain day, if that makes sense?

JACKSON PEOS: Absolutely. So, short answer, yes, I do. Now the reason I think that is ... so we've got a ton of review papers that have been published, which have collated all the different intermittent verses, continuous dieting research, predominantly in overweight populations. Now, essentially, so your listeners will know the review papers what they do is they go and collect all the different research and they sort of statistically observe what is the general trend. Sort of, is one better than the other and by how much? Now the conclusion that most of the intermittent energy restriction review papers have sort of concluded is that an intermittent diet isn't really any better than a continuous diet from either a fat loss or a muscle retention standpoint. But like you said intermittent energy restriction involves a number of different dietary protocols and they're actually quite varied. Now when you look at the sort of the individual studies that comprise these review papers, you'll notice that over 90% of the intermittent diets that are included actually involve sort of these drastic intermittent fasting protocols that you touched on. Now when I say intermittent fasting, in a research context, this doesn't really refer to time restricted feeding. So, I'm not talking about the 16 and eight feeding method or anything like that. What we're referring to is in the context of intermittent fast here is sort of a period of extreme dieting or very low calories or extreme deficit, alternated with a period of sort of less dietary restriction or sometimes no dietary restriction. Now like you said, some common examples we've got is the five two diet. Now

essentially what this means is for two days out of the week someone might consume zero to 500 calories. So, we're talking varied, might even be eating nothing. Then on the other five days of the week sort of they'll eat normally as they would in a non-weight loss sort of derived phase. Now we've also got another one which is the ADF or alternate day fasting. And this is similar in that it contrasts a day of zero to 500 calories on one day and then the next day, they'll eat normally, and they'll just alternate that through the week. Now, the reason I don't think these are particularly beneficial is when we compare these extreme intermittent and diet protocols to more moderate intermittent diet protocols, which is something we referred to in the literatures, Maude IO: Intermittent and Moderate Energy Restriction. While we're not seeing any benefit to these very severe intermittent fasting protocols, when you compare intermittent and moderate enduro restriction to continuous energy restriction, we're almost always seeing a benefit in some sort of weight loss outcome or psychological metric to the intermittent and moderate approach over the continuous approach. So the problem we have here is when you look at the majority of intermittent and dieting research, it's easily to sort of draw the conclusion that: Okay, intermittent diets probably don't have much merit or they're just do what you prefer whether you want to do intermittent or continuous, it doesn't matter. But like I said, the problem that I have with the majority of these studies and the majority of these review papers is that they're biased heavily by these extreme intermittent and fasting protocols. Now I focus mainly on nutrition for athletes. Now if you took an athlete and you told them that they were going to have no food on a day or 500 calories on a day or something like that, and then they had their training session in the afternoon, they'd probably just push themselves into just performing or playing crap anyway regardless of there being sort of low energy availability for the session itself. So, in terms of practical utility of these intermittent fasting protocols for athletes,

I don't really think we have any. I don't think that any coach ... I don't see any reason why a coach should be advising sorta ADF or five, two for an athlete because it just doesn't make logical sense for them to be in such a ... even though it's a short, severe deficit, it doesn't make sense for an athlete to be in such an extreme or low amount of calories for, for, for however long. Now while we don't think these intermittent fasting protocols are effective, that shouldn't put a massive gray cloud over intermittent dieting itself. Because when you, like I said, when you do pull out these sort of intermittent moderate energy restriction protocols, which are still alternating a period of dieting with a period of higher feeding, but the deficit is much more moderate, we're not talking where we, this might be like a 25% reduction below weight maintenance requirements or something like that. When you pull out those individual studies, like I said before, almost always we're seeing a benefit to the Mod I approach versus a traditional continuous starting approach.

DANNY LENNON: Sure. So just as most of them are laid out, it kind of strikes me as similar, but almost the opposite way around that are set up. And by that I mean if you look at something like a five two diet or even alternate day fasting where you have feast days where you can kind of have as you wish or especially the five, two that works just two days a week, you're essentially talking about eating normally or maintenance most of the time and punctuating that with extreme restriction to try and just generate a caloric deficit. With the moderate intermittent restriction that you're talking about, it's more about very similar to our normal consistent dieting where you actually feel like you're dieting but that's punctuated with these higher days to kind of remove that. So, kind of seems like a big distinction there. And it seems that more of the focus is around restoring some of those adaptations where at least I think especially for the obesity research, it's more looking at: Can these intermittent fasting protocols just generate a calorie deficit that we need without someone feeling like

they're dieting every single day of the week. So, I think there are completely different things, With that, maybe if we look at some of the data that does look at this more moderate intermittent restriction. One of the things you often highlight is ... and what's probably so novel about your work is that you're looking at resistance trained athletic populations. So far, we've got some pretty interesting stuff in some obese populations and one that a lot of people listening will have heard of before is the Matador Trial. And I know that you know one or maybe more of the investigators there quite well. So maybe that's a good place to start. If we talk about your thoughts about Matador, maybe for people who are unfamiliar to catch them up, explain a bit about what that trial was and then any other trials that you think kind of give us a sense of what data is actually out there right now.

JACKSON PEOS: So, the Matador study was sort of the first study that, in my opinion, drew massive attention towards the utility of diet breaks. So, if you remember what I talked about, diet breaks before, it's sort of three to 14 days of higher feeding alternated with sort of a deficit period. Now what they did in Matador, this was in overweight men. They had two groups. One was a traditional continuous dieting group where they dieted straight for 16 weeks. Now in the intermittent moderate energy restriction group who had a 25% caloric deficit as well, after every two weeks of dieting they gave the participants a two-week diet break. So, they established energy balance very accurately because they remeasured resting metabolic rate every two weeks. They gave the participants enough calories to maintain their body weight for a diet break for two weeks before going back into a two-week dieting period again. So, they just, essentially, they just alternated between two on and two off until they'd accumulated 16 dieting weeks the same as the continuous dining group as well. Now what was really exciting about this paper was at the end of 16 dieting weeks, they observed that the intermittent and moderate

dieting group had actually lost more weight and more fat. They retained their resting metabolic rate at a higher level than the continuous dieting group. And they actually regained less of the weight and the fat at follow-up, which is a super important finding because we know sort of that as a general population, we don't really have problems with losing weight. We can lose weight just fine. The main issue comes with attempting to maintain the weight that we've lost. And we know that we have very high regained rates when looking at the weight loss research. So, that was very exciting because it showed some quite significant benefits of an intermittent and dietary approach compared to sort of your standard continuous dieting approach. Now we've also got a handful of other moderate intermittent dieting studies, which I think are worth touching on because it highlights sort of how some of the variation of different protocols, whether you want to go with a refeed or a diet break method, but it shows some of the consistent findings that we're seeing with these dietary protocols. Now, one we had in 2014 was on overweight women. Now, I'm always saying overweight women, but I'm sorry, overweight populations. But you got to remember that sort of, like I said before, this is where all the funding goes. It's much easier to do these sorts of researches in these sorts of populations because you've got the money to do so. For example, like you said, I'm quite close with Amanda Salus who was one of the primary authors on the Matador Study to put this in context for how much funding these sorts of studies get. So, they had 150 people in this study. All of the meals for the 16 weeks of dieting were paid for and provided by the researchers. Like this is monumental amounts of money.

DANNY LENNON: Before any of the testing is taken –

JACKSON PEOS: They're getting massive coin here. So, back to the study, overweight women, this was only a six-week study. Now, again, we've got that continuous dieting group as one group. They did six weeks diet straight. On the other side, we had

an intermittent moderate group who did 11 days of dieting, then a three day refeed. Now, it actually wasn't ... we can argue about sort of the hard definition of a refeed and how much someone should be eating on a refeed. But essentially what they said is just eat normally, just eat what you used to do before dieting. So, when they mapped this out over the six weeks, they saw the intermittent group, because of the three day refeed, they ended up eating more total calories over the dieting phase then the continuous group. But despite that ... but despite having significantly more energy in, they lost just as much fat and weight, which is translating to something that we refer to often in weight loss research, which is this weight loss efficiency or fat loss efficiency, which is essentially just the amount of weight or fat that you can lose per unit of chloric restriction. So, they had less caloric restriction, but they lost just as much weight. The other cool findings we saw with that study were that, again, when they followed them up after the diet, they had regained less of the weight and they also maintained their resting metabolic rate at a much high level throughout the study. And even at week six, it wasn't significantly different to week zero, where if you contrast that to the continuous group and they have the graph on the publication, you can see it's a quite aggressive, progressive decline in resting metabolic rate over the six weeks in the continuous dieting group. So, they're sort of ... I guess if we class them as sort of the diet break studies that we have at hand. Now, what's sort of very common in sort of these fitness circles disease, sort of these double day refeed studies ... oh, sorry, double day refeed protocols everyone likes to do where they might diet for five days and then Saturday and Sunday, they get a boost in calories. Now they had a mass study published 2017 and again, Amanda Solace was involved with this study, as well. And they did it very similar to a typical sort of, I guess we could call it a contest prep or bodybuilding contest prep or something like that. So, it went for 12 weeks. On one side we had a continuous

diet group, zero to 12 straight. And on that intermittent and moderate diet group, which was ... let's keep in mind, they did five days of dieting and then a two day refeed, and they saw that after ... and they just alternated it. So, five days dieting and two day refeed and recycled that for the 12 weeks. Again, this translated to the mice eating more calories. Sorry, the intermittent dieting mice eating more calories than the continuous dieting mice. But again, they lost just the same amount of weight and same amount of fat, which is if you take this in the context of working with athletes, the ideal situation is to sort of diet your athlete where they're losing the required amount of weight that they need to lose each week, but on the highest amount of calories as possible. So, what these intermittent, some of these intermittent diet studies are showing us ... the intermittent moderate dieting studies is showing that you might actually be able to eat more calories with these protocols and lose just as much weight as you would sort of with a continuous dieting approach. Now I will caveat and say, okay, because my studies get criticized quite heavily, but one of the benefits of my studies in the context of nutrition is we know exactly what they're eating. We weigh their tray. We weigh their char tray at the start of the day. At the end of the day we take it out. We measure the difference. We know the calories and protein, carbs and fats going in. In the context of humans, we know that we can tell them to eat a certain amount. They might not necessarily eat it and we also know humans lie. They might tell us that they're adherent or they're eating to a certain number of calories, but they might feel guilty about the packet of Tim Tams they had or something like that. So, I don't think we should disregard my studies completely in the context of this. Now, the listeners are probably thinking: Okay, you've got studies on overweight people. They're sedentary. They're not doing any activity. You got some studies on mice like we care. What we really care about is these athletes' studies and 100% we do. And up until last year we actually had zero studies comparing a

continuous to an intermittent diet in athletes. I always find this quite funny because when you talk with sort of athletes and coaches, they give you this impression that refeeds and diet breaks are these sorts of very front edge science with a whole lot of evidence behind them and things like that. But believe it or not, we had zero research supporting these practices in athletes up until last year. And this study that I'm referring to hasn't even been published yet, but we're lucky enough to have got the conference findings. And I'll touch on this study now cause it's probably the first study that we've had that sort of said: Okay, well, we've had a pretty decent theoretical rationale for why we think intermittent diets could have merit. And we've got some data that shows intermittent moderate diets could be better, at least in overweight people, in mice. But now we've got data that says, yes, they're probably better for athletes, as well. Now, this study was headed by Bill Campbell at USF, and their protocol was very similar to the mass study that I just talked about. So, after every five days of dieting, they gave their resistance trained athletes a three day refeed. Now, this study wasn't 12 weeks. It was only seven weeks. So, they had sort of seven blocks of five days dieting, two day refeed, and that contrasted of a continuous dieting group again who just did the seven weeks dieting straight. And what was particularly cool about this study was they actually matched the weekly caloric deficit between the continuous and the intermittent dieting groups, which meant that the intermittent group had to diet just a little bit harder on their five dieting days to match the sort of the same deficit that was spread over seven days and in the continuous dieting group. So, over the seven weeks, they had the same caloric deficit if you look at it in average numbers. And at the end of the seven weeks, we saw that the intermittent group had retained more ... so, lost less of their lean mass than the continuous group. The continuous group actually lost significant amount of lean mass. Now, we care about lean mass because we know lean mass comprises muscle and glycogen. And

I talked about glycogen before, as glycogen saturation is a strong correlate of performance and we know that muscle strong predictor of performance also. It's specifically for bodybuilders obviously like their muscle mass that they can show on stage is the number one sort of consideration that they have during their dieting phases. So, we saw better retention of lean mass in the intermittent moderate group. Yeah. Another cool finding, we also saw was that the intermittent refeed group, they maintained their resting metabolic rate at a higher level than the continuous group. The continuous group dropped quite significantly. Now, again, we care about this because the more calories that we're burning throughout the day is going to translate to sort of better weight loss efficiency, sort of losing more weight on the same amount of caloric restriction. And when we can maintain our resting metabolic rate at a higher level, at the end of the diet, with less suppression, we're less likely to sort of regain the weight in an aggressive way. So that was a massive win for sort of the intermittent dieting clan. And particularly relevant because this was the first time, we'd seen this sort of thing in an athletic population despite the prevalence of these refeeds and diet breaks in the fitness community.

DANNY LENNON: Right. And I guess that's where we're trying to get to at research these different converging lines from different areas. So not only mechanistically but then rodent trials, obese populations and then now athletic populations. And if they're starting to converge on a likely conclusion that we can have more faith in that. And I like that you compared the rodent diet to a contest prep. Maybe we need to have that like a rodent bodybuilding. Probably not too far off at some federations now. They're so many divisions. So, we're at this point now where like you said, we got this study from Campbell that show that there seems to be something to this, at least for the athletic population that kind of marries up with what we'd hypothesize too. So that probably brings us to a nice place to start to

discuss your work specifically. So you've obviously published a few reviews on this, which I'll link up for people to read, but the big trial, this ice cap trial that you're doing right now is, as I've said to you, super impressive of just in its magnitude, what's being looked at, number of people and so on. So, I'll let you describe it for people, so I don't butcher it, but maybe give people an outline of what exactly the trial is and then why you've kind of set up this way of what you're trying to actually answer.

JACKSON PEOS: Yeah. So, we've Bill's paper, like it's a nod in the right direction for in terms of sort of intermittent moderate dieting, but we still have so many questions that are left open. Like there's Bill's study, while it was great, it was far from comprehensive. Now with the study that I'm running at the moment, which is like you said, the ice cap trial, which stands for intermittent versus continuous energy restriction compared in an athlete population, what we're doing is instead of just seven weeks, we're going to give them 12 dieting weeks and we're going to track a whole lot more sort of variables and outcomes than what Bill's team did. Now we're recruiting 60 participants, resistance trained athletes, for this study, which is more than USF paper. And I did this because when we're talking in the context of sort of athletes now a common thing you hear with athletes is this term smallest worthwhile change, which essentially means what is the smallest performance benefit, whether it's a one second improvement in sprint time or five kilo increase on your total or sort of half a kilo of less body fat. What is the smallest difference that is practically significant for an athlete? Now, let's take this and imagine for overweight people who are losing weight. 500 grams, one kilo of fat difference in an intervention, a fat loss difference, is not practically significant. But when you've got a bodybuilder who's getting down to sort of let's say 5% body fat, sort of a kilo of body fat is absolutely practically significant for those guys. And they'll give up arm and a leg to get that. So, the changes, this

dives into a little bit of the statistics side of things, but when you're trying to pick up these really small differences and you want them to be revealed as statistically significant, this means your cohort has to be quite large, the smaller the difference you want to pick up. Otherwise you could, if you had sort of 15 people and you were looking for a one kilo difference that could just be due to chance or variation. So, the larger the cohort you get, the more confident you can be with your conclusions. So, we ran some of the analyses and worked out that to pick these very small differences in lean mass retention and fat loss, I'd need at least 60 people which is a lot. Right?

DANNY LENNON: Absolutely.

JACKSON PEOS: And I probably didn't appreciate sort of the full magnitude of what it takes to do a chronic 12 week dieting study with 60 participants. But it was a good learning experience and I'm happy to say I'm over halfway through it now. But anyway, more into the details of the study. So, we've got 60 resistance trained athletes. On one side of the coin we've got 12 weeks of straight dieting in the continuous group. Now in the intermittent dieting group we get where we're not testing refeeds, per se. We're testing diet breaks. So, the protocol that we've decided to go with is similar to the Matador where we saw some benefits. But the problem with Matador is by doing two-week diet breaks after every two weeks of dieting, that doubles the length of your weight loss intervention. Now, so if, let's say their 16-week intervention has now blown out to 32 weeks. Right? So, 32 week dieting phase ... sometimes the athletes don't have the luxury of that and typically athletes will sort of diet over three to four months. So, a protocol like that might be less appealing to an athlete because it's, yeah, it's just too long for them. Even though they're putting the brakes on weight loss after every two weeks, it's still a long intervention of tracking and things like that. Now, so what we decided to go with is we said, right, well if we could make the diet breaks less frequent and not

as long, would we still see benefits? Because if we did that would be a more appealing protocol to an athlete because they still get the benefits, but it hasn't doubled intervention length. So, the protocol that we decided to go with was three weeks of dieting followed by a one-week diet break. So, it doesn't double the length of the intervention. If we had a 12-week dieting phase and we wanted ... and which we have got. We've got a 12-week dieting phase, but we're interspersing one-week diet breaks every three weeks. It only adds on an extra three weeks to the phase. It's not as extreme as doubling the protocol or something like that. So, essentially the both groups do 12 dieting weeks, but the intermittent group has these diet breaks that break it up. And what we're looking at is we're gonna look at the basics. We're going to look at fat loss and lean mass retention, the differences between the groups; their primary outcomes. But we're also gonna look at some other really cool things that sort of ... cause I wasn't satisfied that Bill's study was answering enough of the questions that we had in relation to sort of some of the theoretical benefits of intermittent diets. So what we're going to look at is performance measures by strength and endurance and we measure that very accurately using isokinetic dynamometer because if you remember I talked about some of the theoretical rationale of diet breaks and refills before was you might, with these increase in calories, you might just be able to train a little bit harder and tolerate a little bit higher volumes. And this could potentially improve performance over the course of the weight loss phase. So, we're going to be tracking differences in performance, which hasn't been done before. We're also going to be tracking measures in the blood, which again hasn't been done comprehensively. Bill's study tried to look at leptin, but he had nine participants for that and I'm not ... and they showed no significant difference, but I'm not convinced that that is a sufficient end to sort of pick up these differences that we're looking for after just a two day refeed or something like that. But yeah, so in the blood we're going to be looking at those appetite

hormones I talked about before, how they change and the differences between the two groups - leptin, ghrelin, PYY. We'll look at some of the anabolic hormones like testosterone and IGF. We're even going to look at thyroid. And we know thyroid is a hormone that sort of regulates our energy expenditure. And of course, we're going to be tracking how resting metabolic rate and energy expenditure tracks over the course of the diet. And even going to be looking at some of the psychological markers. So, we've got these sorts of ... I gathered around sort of 16 or 17 of sort of the best questionnaires that I could find out in the research, put them all together in this big battery of questionnaires and the athletes can complete this every few weeks. So, we are also going to get a sort of a picture of how their mood state, how their mental state and how their psychology is transitioning over the diet phase. Because like I said, there's a theory that sort of an intermittent diet by breaking it up into more manageable phases and by providing these short-term rewards and increase in calories that it could lead to sort of a more positive psychological state than a continuous long diet. We're going to be able to see that which again hasn't been seen before. And one of the final really cool things that we're doing is, which again has not been done before, is by measuring some of these markets. So, resting metabolic rate, hormones and things like that. Immediately pre-diet break and immediately post-diet break. So, we're going to be able to answer the question which is a question I've wanted to answer for a long time. And the question is: Do we truly actually see this metabolic normalization or metabolic boost from a diet break? And do we actually see a restoration of hormone levels like leptin and things like that from these diet breaks. And that question has just never been answered sufficiently before.

DANNY LENNON: Right. Yeah. It's kind of interesting to think of all the other questions we could ask given that this trial hasn't even finished yet and you haven't had time to look through the data. But if

we look at what you're, one of the big things that we'll hopefully learn from this is whether indeed there is this direct superiority for one method over another for this type of population. And I think it's awesome that we've so many people that you can look at and all these measures as well. But there's other questions that came up today and just I'm sure that you've talked to others about in general because I know you've mentioned it a few times around, even if we do find out there's a benefit, then it kind of opens up almost another 10 series of questions of: Okay, now that there is a benefit, what does the duration look like? What is the ... how long should these go for? What is the frequency? How many weeks between each? What is the time course for some of these adaptations that are reversed and so on? Can you maybe touch on what other questions are in the back of your mind that probably in the future we can maybe look at trying to answer as well that you think are kind of important to this general area?

JACKSON PEOS: Yeah. That's a good question. So, with the leptin, so we saw that when you overfeed people on calories, you get this leptin release. Now that's great. But it's only really significant if it's going to translate to meaningful increases or sort of normalization of energy expenditure. And even if it does, what is that impact having on sort of the primary outcomes, which is sort of the body composition changes. Because with the diet breaks and refeeds, we could see that sort of after seven days of maintenance you get this short-term release of leptin. But that still leaves us with a few questions. The first question is: Well, how long does the boost last? Because if it's like a blip, it'll last for a day. Well, that's almost probably meaningless because it's not going to translate to sort of superior body composition outcomes most likely. And the other question is sort of, even if it's boosted and boosted for a while, is it boosted enough that it's going to sort of cause a significant enough sort of increase in energy expenditure that's going to translate to something that we want. And then the same questions sort of arise or circle around

sort of this idea of the metabolic boost is: Well, if we give someone a big increase in calories or take the calories to maintenance, we probably will see some normalization. We will see some purely, maybe just from the thermic effect of feeding, we'll see a greater total daily energy expenditure or something like that. But again, it's sort of what is the time course of this? Because if we saw a seven day refeed increase sort of energy expenditure for seven days or even longer, then that's hugely significant. And I would say that would likely translate to sort of superior body composition outcomes. But again, if it's a blip, it's probably not going to mean much.

DANNY LENNON: Yeah. One thing that again, we will only be able to hypothesize on right now, so I'll just ask for your kind of personal thoughts as opposed to anything related to research. But to me some of this seems like there's probably a personality component that would probably play a role in how someone is affected by these different dieting strategies. So, it's the same thing that happens when you look at aggressive dieting versus more moderate calorie deficits. Some people might prefer this kind of get in, get out idea, like I'll just diet harder, but the diet will be done quicker. Whereas other people, no, I need a bit more food, but I'm willing to go a bit longer. And you could probably make the case that you might see similar things with either intermittent fasting or intermittent energy restriction in the way we've discussed today that some people are just going to much prefer the idea of that I don't need to continuously diet for x number of days or it's going to be broken up a certain way. And it might suit that personality type a bit better than others. That look I'm just going to hammer myself for a few weeks and be done with it type of thing. Do you have any kind of thoughts or ideas that you've seen in practice with the people you've worked with?

JACKSON PEOS: Yeah. So, I've got an opinion on this and I do think that there is a subgroup of athletes that are not suited to sort of intermittent dieting. Now,

I've used that analogy before of sort of when you're taking a dog for a walk on the leash. When it's on the leash, it's happy to just walk by you at the same pace. As soon as you take the leash off, once it gets that little sense of taste of freedom, it just wants to spring away to the other side of the park. Now if we put that in the context of sort of a refeed or a diet break, sort of the walking on the leash period would be sort of these deficit days, these caloric deficits and then the refeed or diet break could be once they're let off the leash. Now in a perfect world, the adherence during the refeed or the diet break would be the same as during the caloric ... the deficit periods. Right? But it can be a problem for some because they get a taste of these more calories and sometimes, they manipulate some of their food choices and sometimes they head towards more palatable foods because they've got more carbs and more calories to work with. Sometimes they get a taste of this and it just leads to a spiraling effect where they have some and they just want a whole lot more. And people need to understand that with refeeds or diet breaks, even with a sort of quite a ... taking yourself up to caloric maintenance during a dieting phase is not going to leave you completely satiated. And I think that's one of the common misconceptions is they think when they have a refeed that you're going to be so full and satisfied and it's just not going to happen. So, people need to sort of see ... I think people need to change their sort of perception on refeeds and diet breaks and see them as a tool and not so much as a sort of let your hair down sort of thing and just see it as a way to actually improve outcomes, not as a way to sort of like: Okay, you did a good job; now, you can relax a bit. So, there's a subgroup of people that ... and I've seen this working with some athletes as they're completely fine adhering to low calories. The second you say that they can have an extra 300 grams of carbs, it turns into a cheat day.

DANNY LENNON: Yeah. It's interesting you say that because now that you mentioned there is actually some research that kind of hints of this, not

necessarily in athletes, but in relation to some of the alternate day fasting models where you see a lot of those trials on average, have showed a benefit that you see the mean average for people, is on their feasting days where they can kind of eat as much as they wish, they don't overcompensate to the point that wipes out the deficits.

JACKSON PEOS: Can I just jump in and say?

DANNY LENNON: Yeah, sure.

JACKSON PEOS: I still think there's a limitation of these sort of papers before because you've got to remember that with these sorts of papers with overweight people when they're recruiting for an alternate day fasting sort of study, the motivation for these people is to lose weight. Now, if they're told that they're going on an ADF protocol and they say, okay, we'll eat whatever you want on the second day, they're there to lose weight. So sometimes they just don't, they just feel guilty and they want to lose the weight anyway, and they have this sort of a conception that eating sort of normally is going to lead to weight gain and things like that. So sometimes they really under eat when they're not supposed to. So, I think that's some of the ... one of the small limitations of those sorts of papers.

DANNY LENNON: I 100% agree with that. The only reason I bring it up is there's one particular study I remember where they collected some subjective ratings and questionnaires from some of the participants afterwards. And when you kind of parse out from the mean average compared to individual points, you saw that a lot of them were able to ... they didn't overcompensate on their feast days and therefore they were able to lose weight. And then on average, the group did. But in this particular study, there was a number of participants who actually did eat up to a point where it blew out their fasting day the day before and there was no net deficit. And these people, subjectively they term as big eaters. So those that reported that they have a big appetite, so all

the time like eating big meals and tend to overeat when they get the chance. And it kind of reminds me of what you said with certain people once they have that bit of freedom and they've been so restricted beforehand might do better with still some rules in place.

JACKSON PEOS: Yeah. I think that's a perfect example of that subgroup that I was referring to before. But I will make the point that ... this is not hard data by any means, but so with the ice cap study that I'm running at the moment, we've had about sort of 30 that have got through the entire dieting protocol and I've got about 20 that are still in the study at the moment. Now I have to deal with these ... all of the participants every week. And I see them when they come into the lab and things like that. And I will say just from my general perception, it seems like the intermittent dieting guys and girls have a much better mood state, a lot more positive ... just getting a whole lot more general positive feedback from that side of the group compared to the continuous dieting group. And I can really perceive like there are sort of negative impacts on their mood and they're a whole lot less bouncy when they come to the lab and they just don't really want to chat too much and things like that. So I do think that there's a subgroup that intermittent dieting wouldn't be suitable for, but I think on average, just from my experiences with working with ... sort of putting 50 guys through the study so far, I think most would, at least from the study, would be suited to an intermittent diet.

DANNY LENNON: Yeah. And you could probably make a fairly strong case that those people that were at learning it might not be suited for and they're given a bit of freedom. You could probably mitigate that almost completely by giving them some guidance around what to do on those refeed days, be a bit more tighter. So, like if they're recommended to pretty much eat the same meals as they do otherwise, but just a bit bigger portions or other areas like that you could probably mitigate that to a large degree, I guess.

JACKSON PEOS: A major problem with some of the guys that can sort of turn their refeed or diet break into binges, during their dieting periods, they might be filling the majority of their carbohydrates with sort of low palatability, high satiety foods like oatmeal and sweet potatoes and things like that. And then all of a sudden, they've got 300 grams of extra carbohydrates to play with for a day or a week or however long. Then all of a sudden, they start trying to fit in sort of sushi and cereals and low-fat ice cream and things like that, which are sort of highly palatable, less satiating and a whole lot more easier to eat on. And I think because they have these ... they're probably tasting these foods that they might have; they haven't had for three, six, nine weeks. Once they get a taste of it, they just want a whole lot more of it; so, I think that's definitely a very practical technique that you can use for some of those guys that are finding it difficult to stick to the targets on those days.

DANNY LENNON: Ironically, they're probably feeling hungry on those refeed days because -

JACKSON PEOS: I'm sure you've heard of it. Like people talk about being hungry on refeed days and I don't think it's like that. People have speculated that, oh yeah, the metabolisms ramping up and that's causing you to want more calories. I don't think it has anything to do with that. I think purely it's because they're eating more food, tastier food, and they just want more of it.

DANNY LENNON: So, with this and from what you've seen both in practice and kind of anecdotally as well as what your impression is you're starting to get from the overall literature, I'm sure there's a lot of people thinking: Okay, this sounds like this could be a potentially very useful tool. And so for practitioners that are listening, nutritionists, dietitians, personal trainers, what do you think is fair to conclude right now that if they were going to try and start using some of these strategies, where is some kind of safe baseline starting points that they can start using as an

approach and maybe tweak from there, but where would you start them off as, here's a good place that we know is likely to be beneficial?

JACKSON PEOS: So, I go through a lot of these on my review papers I published last year. It's titled Intermittent Dieting Theoretical Considerations for the Athlete. And it goes into a lot of the things that what you just touched on there. But a best place to start is I'll start with some general recommendations. Now this would also apply to continuous dieting approaches, but you would want to, in a weight loss phase, whether it's intermittent or continuous, you'd want a pretty high protein intake, so somewhere between two to 2.6 grams per kilo of body weight per day, which is typically higher than you would eat in a weight stable phase of your season. You also ... when we're dealing with athletes, doesn't matter whether they're doing continuous or intermittent dieting, you typically want the rate of weight loss to be moderate. Because we know that when an athlete who's typically lean, if you're trying to speed weight loss up too much, typically we see significant impairments in performance. We see negative impacts to mood state. They become more irritable, more susceptible to illness, more susceptible to injury. And I think it's because its low calories, low energy availability coupled with a very high physical energy expenditure or high training load. So, when you're dealing with athletes, which is sort of my area of expertise, typically you don't want weight loss to be too fast. So even if you're planning an intermittent diet, aim for somewhere between half to 1% losses of your body weight per week. For example, in the ice cap dieting study, we're aiming for all our guys, it doesn't matter where they are in continuous or intermittent group to be losing 0.7% of their body weight per week. If you don't want to use sort of a percent body weight metric, sort of limiting the caloric deficit to 35% below weight maintenance requirements per day is probably a realistic recommendation as well, which is why we don't think eating zero calories in these IDF and five, two protocols would be

particularly smart. Another one is while you're doing these things, we want to be doing weight training. And this is probably quite obvious to your listeners because we know that with weight loss interventions with weight training thrown in the mix, typically we retain more fat free mass and we know fat free mass contains things like muscle mass which are extremely important not only for the bodybuilder who's stepping on stage, but also sort of the sports athlete who requires muscle for performance. And we also know that fat free mass is particularly metabolically active compared to sort of fat mass, which means the more of it we can maintain is going to translate to better sort of maintenance of our resting metabolic rate and resting energy expenditure. Now some specific sort of guidelines for mod diets only, it makes sense to ... so we know we have to increase calories during a refeed or diet break and we're not 100% sure if it matters where these calories come from. For example, if it didn't matter, we could just increase protein, carbs and fat evenly, or we could just increase sort of the macro nutrients that we prefer. But there is some evidence that increasing carbohydrate might yield better benefits than increasing protein or fat. And we think this is for a couple of reasons. One obvious reason is we talked about glycogen depletion before and we know that when sort of glycogen levels get low strength and endurance performance is compromised. By giving someone a carbohydrate dominant refeed or diet break is potentially going to refill muscle glycogen stores. And it's going to translate ... we don't know how long for; it's going to be temporary. We don't know how long for, but it's going to translate to at least some sort of acute training and put the performance benefits after the refeed or diet break. We also know that that hormone that we talked about before leptin is particularly sensitive to carbohydrate, more sensitive than fat. So, if he gives someone an influx of carbohydrate, it's possible that it could trigger a leptin release and we know that leptin has positive effects on our energy expenditure and our satiety, which could sort of lead to the

diet phase being sort of better weight loss efficiency and easier dietary management. Now, in terms of ... this is where sort of, we don't have hard recommendations and it comes down to how often should our refeeds and diet breaks be and how long should they be. And unfortunately, we don't really have a clear answer. Eric Helms recommends diet breaks every four to eight weeks and that relies heavily on anecdotal reports. We don't have any evidence of those sort of protocols being used in the research. But from the diet break research we do have, we can sort of confidently say that sort of a two-week diet break after every two weeks of dieting is probably going to outperform a continuous dieting approach. But the caveat there is we don't know if that's the optimal arrangement. And to be honest, it's probably not, especially for an athlete. We're not sure if the ice cap protocol with three weeks dieting and then one-week diet break, we're not sure if that will be better than Matador, but we should be able to find out shortly. So, it's a little bit tough to give hearty recommendations on these diet breaks because we've got two-week ones, we've got one-week ones and we've got them every two, every three or up to every eight. So, a little bit hard there. But in terms of the refeed method which is sort of this shorter-term period of higher feeding, I think we can confidently say, because we've got strong anecdotal reports of this protocol and we've got the mass study and we've got Bill Campbell's study. We can say that a two day refeed after every five days of dieting is probably going to outperform a standard continuous diet. So, they're sort of the most general recommendations that I can make for sort of how long we should want these sort of higher feeding periods to last and how often we should do them. And I should also add the caveat that there is one school of thought that as an athlete approaches lower and lower levels of body fat that they could potentially merit more frequent and longer diet breaks and refeeds. Now that again has some theoretical rationale because we know that as a person gets leaner, their adaptive responses to energy restriction

get more significant, so we typically see greater losses of lean mass when an athlete gets lean and less fat mass loss. We typically see significant sort of impairments to sort of some of these anabolic hormones that drive muscle hypertrophy, which is going to again make sort of maintenance of muscle more difficult. So, with that in mind, it's logical that because adaptive responses are getting so severe as an athlete gets lean, let's then put in some more frequent sort of bouts of energy balance that can potentially mitigate some of these really aggressive sorts of push back that's happening on the athlete. But again, based solely on sort of a theoretical basis and we don't have the data on that just yet, but I think it makes reasonable sense. Now I'll make this a final thought on sort of recommendations for refeeds and diet breaks and it comes down to sort of should there be any strategic planning in regards to when we should have a refeed or diet break. Should we sort of program it around certain blocks of training or certain phases of training or something like that? Now there is one school of thought that by giving you a diet break or refeed during sort of a deload week where training volume decreases that you can get this sort of hyper recovery phase or hyper recovery effect. And again, it's a sound rationale but we're not ... I'm not sold on it just yet. And in my recommendations, in the review paper, I actually said that it probably makes more sense to sort of implement a refeed or diet break where you're having higher calories during a period where training volumes probably pretty high. So, an example of, in the case of a bodybuilder, would be giving them sort of let's say a seven-day diet break on the last week of their high-volume phase just before a deload. And I think this makes more sense because we know when we look at the research when energy availability and carbohydrate availability is high, people are able to tolerate and recover from higher training volume. So, I think it makes more logical sense to sort of give an athlete more calories when they're doing more work.

DANNY LENNON: Right. Especially when risk of injury from the workload is up as well.

JACKSON PEOS: Correct.

DANNY LENNON: Yeah. It's super interesting. I think probably the difficulty when you talk about the frequency or duration of refeeds or diet breaks is not only just the lack of data we have right now, but even if we did the almost uncountable number of combinations or could be and how each of those variables if you changed them again changes the question. Right? So, we could be asking about how frequently would be do them, but then if we say, well the refeed period is three days versus we actually refeeded them for one day or five days, that changes maybe the frequency part or if we change from the degree of restriction. So, if we're doing five days of dieting and two days of a refeed; well, does it matter if that restriction was a 20% deficit versus 40% of how long we need to refeed them forward and to what magnitude? Like there's just so many different combinations.

JACKSON PEOS: Yeah. I think all we can really say is that as the duration of the refeed or diet break gets shorter, it looks like they're getting more frequent. But that's super general. That's not much to go on.

DANNY LENNON: I suppose maybe from a practical standpoint, people could try and look at some metrics that they could follow and see, okay, is this having some impact on whether it's like subjective mood states like you say or their training performance or so on and then kind of maybe play around with it and tweak it from there. But I think you've given some really good starting points of an idea of how people can start to implement this. So, I will link up to all of the papers you've published thus far and some more information for people to read through that in more detail because we're coming close to the time here. Before I get to the very final question, where can people not only access those papers, but where can they find you on social media, on

the Internet and anywhere else like that if they've questions?

JACKSON PEOS: Yeah. Sure. So, I'm most active on Instagram just @JacksonPeos and they can follow sort of updates on the research that I'm doing, and you can see me in the lab. Also, on the nutrition scene, I give sort of these little takeaway posts on sort of some of the latest research and what we can learn from it and I put that out across my Instagram, but everything that's going on in my life is put on there ... my personal life. And for the more nerdy people, I'm up on ResearchGate as well, so you can see a more professional look at what I'm doing.

DANNY LENNON: Yeah. So yeah, for people listening, like I mentioned, I'll link up to that all in the show notes as well as all the papers we've discussed in today's episode. I'll link to them too if you want to go and read the full text of those. So, Jackson, that brings us to the question I finish every episode on. It can be difficult. So, get yourself ready. So, if you could advise people to do one thing each day that would have a positive impact on any area of their life, what would that one thing be?

JACKSON PEOS: So, I'm going to go with something pretty general and it's one that I've been working on at the moment. And it goes by leaving something better than you found it. Sort of a motto that I've been trying to follow these last few months. Now this can be sort of interactions with people, leaving them ... when they leave you, they feel better or they've learned something then before they met you. It can be with your work. It can be sort of with the environment. It actually has very broad application. I found just by thinking about sort of ... having this in the front of my mind, it's sort of, it's having a positive impact on sort of my general sort of life and output. So, it's a general one, but I find if people give it a try and think: Okay, am I leaving this situation or this sort of interaction or am I leaving it better than when I found it? Or let's certainly make sure I'm

not leaving it worse. I'm enjoying doing it and I think it's having some benefit.

DANNY LENNON: Awesome. I love it man. Thank you so much.

JACKSON PEOS: It's been an absolute pleasure. Thank you.

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