Danny Lennon: And we are here. Jacob welcome to the podcast. Thank you so much for joining me today.

Jake Meys: Hi Danny, thanks for having me on. I appreciate it.

Danny Lennon: It's my pleasure and I'm very much looking forward to a discussion of a number of the things that we're going to get into today based on some conversations we've had online and previously talked about on a call. So I think it's an area that a lot more attention needs to be placed on and I definitely have enjoyed hearing your thoughts and insights. And I think that's going to be even more beneficial once people hear some of the work you currently do and places you've been involved with. So before we get into the good stuff maybe to kick us off, can you give an outline of people, of your current role, the current work you do and some of your academic background and places you've been involved with.

Jake Meys: Sure. Absolutely. So as of right now I'm a postdoctoral research fellow. So for people out in the research world, that basically means that, you know, I'm training to become -- I'm an independent researcher myself and the benefit of this is I get to train under some really high quality researchers that do some outstanding work. And my background from the -- stemmed from being involved in nutrition research early on. So I did my undergraduate training in nutrition at Case Western Reserve in Cleveland Ohio. So I was training there to become a registered dietitian. At that time I started working kind of just volunteering in

the skeletal muscle research lab at the Cleveland Clinic under Dr. John Kirwan.

And we'll talk about some of his work a little later under this podcast. But he is one of the premier researchers in obesity diabetes and insulin resistance. And most certainly kind of glucose metabolism or more related to maybe something like sugar intake that people will be familiar with. So from there I really got involved with clinical nutrition, I wanted to go out and do what -- so I went to the University of Illinois at Chicago where I got my PhD in nutrition, physiology and rehabilitation sciences. During this time my dissertation project revolved around identifying mechanisms in the skeletal muscle that may be involved in the process of insulin resistance of type 2 diabetes.
So I worked on something that's called that protein glycation which is essentially the modification of protein molecules by sugar. And so we really showed some interesting pathways that weren't well defined before in the literature of individual type 2 diabetes where, you know, sugar directly can kind of have a negative impact. So from there I finished up the PhD and went back to the Cleveland Clinic and started working as a research fellow there and started up some really cool projects related to a variety of topics in nutrition. And then our lab transitioned down to the Pennington Biomedical Research Center in Baton Rouge, Louisiana.

So that's where I'm at right now. Pennington is one of, if not the premiere institutes for nutrition research in the United States. So we get to do some really amazing science down there and I am around some of the most high quality researchers that you could -- I believe you've heard Eric Ravussin and we've had some collaborations with Kevin Hall and whatnot as well. So really some outstanding scientists that are down here at the facility that I'm really looking forward to learning from.

Danny Lennon: Yeah. That's amazing. And I think it gives a good insight into some of the things that we will chat about throughout the course of this conversation. And maybe a good place to transition there too is a topic that I know you're particularly passionate about making people more aware of and I think is an extremely important one when it comes to discussing nutritional science. And that's understanding what evidence-based research actually is opposed to some of the misconceptions maybe some people have around that term and what it indicates. So what are your ways you would

get people to try and think about that term evidence-based research?

Jake Meys: Yeah. Thank you for bringing this up because that -- it is a point I'm passionate about especially because I know there are so many individuals that are not in science but are really interested in understanding what the best science is out there and, you know, because they want to do the best for themselves, right, even if they're not in the science world. So, you know, the definition of evidence-based research gets a little mangled sometimes, I think. When you're, you know, seeing articles coming up in the news or the media or reading on forums or one of my favorite venues which is Twitter. A lot of times you'll see someone make a statement and then throw up a single article that is in agreement with their statement.

And this gets perceived as evidence-based research, right, because there's evidence behind the statement they're making. But that's really not the strict definition, you know. In all honesty, if you made any statement you could probably go out and find one single article that's supportive of that. So what evidence-based research really means is that you're looking at the entire landscape of research that's out there. You really understand the history of a topic you're interested in so you really need to know, you know, what led up to the most current research and the best way to do this is really look at the systematic reviews on a topic or utilize professional practice groups that put out position statements.

For nutrition, at least in the United States, the Academy of Nutrition and Dietetics is a great one. So if you have a question on a topic, absolutely, you know, jump on the internet and do your search and maybe look for a single article here or there. That's always beneficial practice to do. But if you really want to know what the entire landscape is and what professionals in the field are thinking, really look for those systematic reviews. Look for those statements by professional practice groups because that can really be helpful in making sure that you're reading everything going on as opposed to just maybe seeing a single article here or there that might not necessarily be leading you in the best direction.

Danny Lennon: Yeah. I think that's such an important concept to bear in mind because I'm sure you've often seen it as well where either via an

open question someone may give or even a statement that they're trying to make about bringing up an individual paper or two even and trying to claim this gives us some sort of proof about a certain idea whereas really, within science the thought of any paper being able to prove something is very different. And even if it's highlighting something important, being able to say, okay, this can may be -- asking the question where does this fit in with the larger body of evidence here and therefore where should we place our conclusion of what's most likely to be correct, right?

Jake Meys: Absolutely. And then, you know, kind of a secondary line for maybe individuals that are students or maybe being kind of considering going into the research world. I also start paying attention to our really first and last names on publications. I know first name is maybe a little obvious. Many people look at the first name of the author list and say hey, okay, I know who this person is. But pay attention to that last name too. Quite often this is a place for the senior author of a publication and most often they will be the ones that have obtained funding for the work and who's really primary ideas are behind kind of the overarching theme of the publication.

So keep an eye on those sort of things and the more you begin to recognize researchers' names, the more you become familiar with their work and the quality of their publications. It will make it really easier for you as you move forward to quickly read through articles and, you know, understand what you need to look for. If you've seen high quality publications out of an author many times it makes it a little easier to kind of skim through other methods because they're most likely using similar ones that they've used in the past.

Danny Lennon: Yeah. I think that's a whole other discussion we could get into of assessing the quality of research and certainly it's not all created equal. And there are some certain things to be aware of but I think that's generally a good starting point. And I think we'll probably -- actually some of that might come up later in our discussion particularly when we're talking about some of the systematic reviews or meta-analysis on the topic we're going to discuss at hand. But what I did want to kind of transition to was this general conversation around sugar intakes and the potential effects on health and -- because I know you've not only looked at this area quite extensively but have also been quite vocal of

making some of these, I suppose it says -- I suppose conclusions known or at least challenging some ideas people may have.

And with -- maybe a good starting point I thought for this discussion was when we're talking about sugar I think it's pretty well agreed upon at this stage that excessive quote unquote amount of sugar can cause health detriments particularly people are aware of how that leads to things like obesity or diabetes risk and so on. But where some of the conversation seems to divert and there are quite strong opinions is just what is inherently detrimental about that sugar intake where on two extremes we could have someone saying it's completely down to just driving weight gain through a calorie excess on the other it's just this inherently thing, deadly thing that we need to avoid in all amounts.

And so this is kind of maybe polarization at those extremes. So from your point, when we take the idea of sugar can be in -- have inherent health detriments even in the absence of a caloric excess stash weight gain where would you put your kind of overview summary of that particular point right now or where would you feel you lie on that discussion?

Jake Meys: Great, Danny. Thanks for that nice overview on, you know, the different areas related to sugar intake and some issues that people have. In terms of my stance, I certainly do feel that there are many negative impacts to sugar but I certainly wouldn't want people to overstate them and then unnecessarily restrict their diet because of it. So with that as an overall concept, in terms of the negative impacts of sugar, you know, like you mentioned, there may be issues with developing insulin resistance and long term risk of disease development. But I think more importantly in the short term, you know, if you have individuals that are specifically building certain amounts of sugar into their diet, you do run the risk of, you know, getting calories without a lot of nutrition behind them.

And more importantly than that is building long term eating habits that you want to have -- really be more healthy geared, whereas if you're just cutting sugar and focusing on calories or, you know, building certain amounts of sugar into your diet you may end up being more bodyweight focused which in the short term can be very beneficial but I think in the long term, if you're building a candy bar into your diet every day you can get into poor

eating habits. And if you get outside of some sort of strict dieting that people like to do, those poor eating habits can really just build on themselves and steamroll down a path that is not the healthy way that you want to go.

So in terms of my overall thoughts, I don't have -- I don't think there's any inherent issue with sugar as a molecule, right? We know that when you ingest sugar it gets in your body and turns into glucose like many other of the forms of carbohydrates. The big difference here is that even if there's not a specific detriment to consuming sugar, I think there are specific benefits to consuming other carbohydrate products, right?
Sugar doesn't have vitamins and minerals which is one thing but other forms of carbohydrates, whether it's your whole grain products or your fruits or your vegetables, they contain many phytochemicals that we don't necessarily quantify and you're not going to see them in your dietary reference intakes in terms of you need to get this many amount of, you know, certain different phytochemicals in your diet. But they're extremely important. And we're still really trying to figure out what the exact benefit of all these different phytochemicals are and all these different, really not quantified nutrients that are in carbohydrate sources as opposed to just having sugar itself.

Danny Lennon: Right. So even in the context where someone isn't necessarily overeating on calories or causing weight gain with -- in the short term, simply the choice of having proportionally more sugar in the diet comes at the expense of including other foods which could have inherent benefits to them. So I supposed the question that maybe some people would ask is well, for being generally healthy and maintaining a healthy body composition, where do we look to for a suitable amount of sugar consumption? And of course they can look up various different dietary guidelines and so on, but translating this to a real person in terms of like practical things to be doing, what -- where do we come down on, at what point does sugar in the diet become excessive or what is an unhealthy versus a quote unquote healthy intake? What is that high intake? How do we even start quantifying some of those things and trying to answer those questions?

Jake Meys: That is a great question, right. And that's one that everyone would love to know. They’re like how much sugar can I have before I start seeing sort of, you know, negative effect on myself? And I think you do a great point to bring up the dietary guidelines

because right now, you know, that's our best measuring stick in terms of what limit we should set as maybe sugar intake. And I think right now it said that 10 percent of our total daily calories. So for a basic 2,000 kilo calorie diet that's essentially, you know, 200 calories from any added sugar. It is good to know that, you know, this doesn't include the natural sugars that are found in items like fruits.

So with that, you know, you're looking about 50 grams of sugar a day is your recommended limit. And I think the word to emphasize here is limits. It doesn't mean you should aim to have 50 grams of sugar in your daily diet. It says, you know, you should really try to keep it under that sort of threshold. In my personal opinion, I think a better word is really to minimize it. So even though we have this cutoff, this limit that says, hey our dietary guidelines, at least here in the United States suggest that if you stay below this number you are doing healthy choices to have a healthy diet and that's great. But I think if you're looking for the healthiest, if you're looking to really maximize your health, the lower you get that number from added sugars generally the better.

Danny Lennon: So if we take maybe someone who is coming from a approach towards their diet that maybe they're trying to include all these kind of high sugar items but they could make the point, “Well, I'm maintaining my body weight at a healthy body composition because I'm sticking to a certain amount of calories or I'm getting a part of the other macronutrients and therefore I'm building in being able to eat these high sugar foods. What are the problems that I might run into by doing that?” So I know you've already outlined missing out on some of the macronutrients and phytochemicals. Is there anything else that you think is -- that people may be running the risk of by trying to go with this approach of, “Well, I'm eating overall a calorie in micronutrient intake, that's okay. But I can still include maybe even more sugar than people might even recommend or that might even be within the guidelines because I am maintaining this healthy body composition.”

Jake Meys: That's a great question. It's one that is a little difficult to answer because I think depending on the overall lifestyle or the other situation that someone is, you know, currently utilizing to reach their health goals. I think that answer would vary a little bit. So take for example maybe someone that's in their mid 30's and that

is, you know, kind of just starting up a new exercise routine but they're not very consistent with it. I think this is really the situation where kind of building in extra sugar because our exercising could be detrimental. So you have someone that is maybe not exercising every day and has a diet where maybe sometimes they're eucaloric in maintaining their body weight but maybe other times they overeat.

So you kind of have maybe the average American situation here, someone in their mid 30's that's trying to maintain body weight but actually slowly gaining weight. And if you're building sugar into that diet, that's where we see issues with contributing to the insulin resistance issue, right. We know that when you consume a lot of sugar your blood sugar spikes and I believe you've talk somewhat extensively about that on previous podcasts here. So I won't go to in depth. But we know that these elevated blood sugar levels are not good and they contribute to the progression of diseases like obesity and diabetes more particularly.

Now, take another situation where you have a younger individual in their 20's and they are very dedicated to exercising on a daily basis. Let's say they get their 60 to 70 minutes of exercise every single day. Is adding any sort of sugar into their diet going to be harmful in the short term? I would be hard-pressed to say so, right. They are going to be using those carbohydrates to rebuild and repair their muscles and it's really not going to elevate their blood sugar because they've created this overall lifestyle and situation where they remain very healthy.

The downside to that is if they are developing eating habits that is building a lot of sugar into their diet, even though they're not seeing short term differences in body composition that may have an effect long term. Let's say in a decade or two or three when they're not exercising as intensely or they have other life situations that have really changed their ability to control their diet and exercise routine. Now those are the times when you want to be able to fall back on your healthiest eating habits so that you don't run into situations where now you're consuming that same high sugar diet but you're not exercising as much or maybe you've replaced some of your home cooked protein meals with something like a fast food meal.

And that's a situation now where we've built habits that include high amounts of sugar intake that are now affecting us later on in

life. So those are the two main issues I would see in terms of where building that sugar intake into your diet may not be the best choice either short or long term depending on your situation.

Danny Lennon: Sure. So if we were to maybe hypothesize about some of these longer term things that can be quite difficult I think to tease out particularly in certain trials but like you say over an accumulation of years or decades may for an individual eventually show up in some sort of form, what at least do we have good reason theoretically and hypothetically that could tie into being some of these problems? For example, I know earlier you mentioned about protein glycation or people may have heard of AGS and things of this nature, what are some of the mechanisms at least you think that could be playing a role under the surface that would many years down the line lead to these issues that may be unapparent over eight to 12 weeks where someone is seeing that they can eat a ton of sugar and maintain a healthy body composition and feel okay?

Jake Meys: Sure. So in terms of variance glycation it's certainly an area that is near and dear to my heart because it was something my dissertation work focused on. So I'll start with the very long term. So advanced glycation or this essential sugar or sugar metabolite modification of proteins is really well known to be a major role player in diabetic complications. So I'm sure many of the listeners are familiar with the major impacts of diabetes long term, right? You have individuals that can go blind, they can have kidney damage, they have issues with their nerves. So that's that diabetic retinopathy, nephropathy, neuropathy, those sort of common insults to long term type 2 diabetes that come in part from a result of advanced glycation in those particular affected tissues.

Importantly, now what we're seeing is that advanced glycation is occurring inside the body in other tissues as well. Particularly we believe the skeletal muscle where it can actually contribute to the development of insulin resistance, insulin resistance being one of the primary insults that begins that progression to type 2 diabetes. So, you know, that's where some of the long term impact can come, not just in the complications of diabetes itself but I think some emerging research is really showing that this high sugar impact or advanced glycation can actually directly affect the skeletal muscle tissues and play a role in insulin resistance at the skeletal muscle level.

I will say that there's more work that needs to be done right now before we can really call it on this point but given the effect that we've seen in with advanced glycation on other tissues, it looks like that may be occurring in skeletal muscle as well. And I'd say -- I'd be confident to say I feel like that's the direction, the advanced glycation research is showing is that we see effect on the skeletal muscle itself which is I know very important to many of your active listeners.

Danny Lennon: Yeah. I think the conversation around AGS is an interesting one because as you're acutely aware, whilst sugar intake is a huge part of this there's also many other factors that can be considered in a discussion around that topic. And to me that kind of parallels the conversation around insulin resistance. And I think given a lot of the mainstream discussion around insulin resistance, sugar and carbohydrates that tends to be what maybe some people think of that as, that insulin resistance is this issue that's just to do -- it's a sugar issue, right. It's someone that's developed this through eating too much sugar whereas we know it's an extremely complex thing that develops in a number of different ways and can be -- sugar or carbohydrates can be a part of that but can also there's many things driving it outside of that too.

So when it comes to a discussion of insulin resistance and then in the context of overall sugar intakes and that could obviously blend into another conversation on carbohydrate intake, we know that there are many causes of an issue like that. We do then on the other hand, people will point to maybe short term RCTs showing that even increases in sugar intake sometimes doesn't lead to a worsening of some of the markers that we would look at in insulin resistance or hyperglycemia when there's not this weight gain. So how do we start to try and consolidate all what we know here of how we should view sugar intakes for people who are maybe insulin resistant, pre-diabetic, diabetic and how that conversation if it all, changes from when we're talking about a normal healthy person.

Jake Meys: Yeah. I think you bring up a great point. I mean, right now I think we're at the state in the literature where we do really understand that sugar is having a severe and negative impact on people that are already insulin resistant. And it really contributes to the natural progression of insulin resistance and type 2 diabetes. So if you do have someone that is obese and insulin resistant you really do want to, not only minimize the sugar intake but minimize really

large meals, right? Because as you mentioned, if you eat a really large meal even if it's all of, you know, sweet potatoes, if you have enough of it your blood sugar will go way, way up very quickly.

So it's also a matter of portion control for those individuals. On the other hand, I would like to just mention some of the recent research that we've done even in the short term that shows not necessarily a negative impact of sugar. Because I think that's pretty clearly defined at this point for those, you know, moderately obese individuals. But maybe a beneficial effect of replacing that sugar with something like whole grains. So some of the work that our lab has done, you know, this was not my primary idea. This is primarily coming from Dr. John Kirwan who's again my mentor that I work under who has done some phenomenal work in the insulin resistance and obesity field.

So I'd like to describe this study because it was one of if not the most well-controlled studies looking at insulin resistance on whole grain intake versus refined grain intake. And this merges quite well into the issue with sugar versus non-sugar. As I had mentioned, I don't necessarily feel like it's something inherently wrong with the sugar molecule. It’s that you're really missing out on all these other potential nutrients that you could be getting from a more whole food approached or from consuming something like whole grains. So the study we did is where we actually took these kind of middle-aged moderately obese adults and for this particular study we had 14 of them and their average age was in the mid 30's.

And there were also overweights. Their BMI was sitting in the low to mid 30's as well. So these are the particular individuals that I think are kind of at the most risk of consuming excess sugar which we already know. But what happens if you're actually replacing anything like sugar or refined grains with whole grains? So we took these individuals and we put them on an isocaloric diet. We used indirect calorimetry which essentially means we just measure the gases that are going in and out of their breath when they're in a completely rested state and we actually measure their resting energy expenditure.

So we knew exactly how much energy they were burning kind of on a day to day basis and we prescribed a diet to them. So we fully made their diets in a metabolic kitchen and we delivered meals to them that either had refined grains or whole grains. So

the diets were completely matched for macronutrients. They were matched for everything except that the fact that one diet had components that were whole grains and the other diet had components that were refined grains.

And I guess maybe just a quick primer, I think most people generally understand the difference between whole grain and refined grain but whole grain essentially uses the entire part of the kernel. So if you think of a grain like an egg because I think people kind of understand the image of an egg a little better where you have kind of an outer shell maybe your inner egg white and then at last the yolk. If you want to compare that to a whole grain, the outside shell would be your brain, the inner egg white would be your endosperm and then your little egg yolk would be your germ.

And so what happens is when you refine grains, you remove the brain and the germ and you essentially end up with just the endosperm which would be your egg white essentially whereas the whole grain products include everything. So you could get a whole egg and put it into your recipe. Now it doesn't sound good to keep your lunch on shells, right? But you get a lot. You get a lot of beneficial components that are kind of in that outer brand. So we generated these diets and then they were, they were either the whole grain or refined grain diets.

Again, isocalorics of people were maintaining their body weight. And then we did some really nice measures of insulin resistance. We looked at postprandial glucose responses, we looked at metabolic flexibility which essentially is their ability to shift from carbohydrate or fat utilization depending on the nutrients we give them. So, you know, if we give them carbohydrates we expect them to start burning carbohydrates that's essentially metabolic flexibility, that ability to shift between nutrient utilizations. And so after this study, not only was it a feeding study where we measured their resting energy expenditure and we fed them their actual diet, it was also a randomized crossover design.

So after they consumed either the whole grain or refined grain diet, the same person went through a two to three month washout phase where they eat their normal diet again and then we gave them the opposite diet. And so this is one of your, you know, prototypical, well designed studies on how to address a specific question. Is there a difference between a whole grain or a

refined grain diet? Isocaloric matched macronutrients and what did we see? We saw that the whole grain diet actually reduced diabetes risks.

And we tend to find that the mechanisms seem to work through reducing their postprandial blood glucose responses or their response in blood glucose after eating a meal and also through reducing peripheral insulin resistance. So peripheral insulin resistance meaning, insulin resistance primarily at the skeletal muscle level. So from this study we showed that there is something inherently beneficial about consuming all the different components, vitamins, minerals, phytonutrients that are found in whole grains that you just don't get if that's replaced with sugar.

What's nice about this study in particular is -- I know this, we are primarily talking about sugar but the study did actually match for sugar content. So there were no differences in sugar between these two diets. It was just a benefit of whole grains. So that leads back to my, you know, main point about building proper eating habits. And if you can build these healthier food items into your diet you're setting yourself up for long term benefit. And this study just came out earlier this year, a couple of months ago and it was published in Metabolism. It was really, really phenomenal the way they used all these quality control measures and explicitly showed the difference between a whole grain and refined grain diet.

Danny Lennon: Yeah. I think it can't be overstated just how high quality of a trial that is. And for anyone who is unclear about just the extent that had to be gone through to make it as well controlled as that and to do all those various things, that's an extremely, extremely impressive trial to set up. What I find particularly important about the message you're communicating Jake is this focus on even if there's no inherent detriment to something, there is lots of potential benefits or advantages we can have to what we include in the diet.

And I think that message is probably what isn't really looked at a lot because I think just the dieting message in general tends to be this one of what should I avoid or what type of diet should lead to a restriction of a certain nutrient or so on. And you can see people that benefit from going on a low carb diet or going on a high carbohydrate vegan diet or going on any type of diet and usually it's maybe not so much what they're restricting really it's that

often times just that change in approach leads to an increase in food quality. And I think that can sometimes be a piece that's left out of the conversation when people are arguing over the benefit of some diet they tried because they restricted a certain type of food or nutrient.

Jake Meys: Yeah. That's a great, that's a great point to bring up. And, you know, I can really appreciate your understanding of, you know, when people are going on certain diets or are doing them for short terms there's other items involved other than just reducing that certain amount of sugar intake, right? Often times people are also exercising a little bit more when they go on a short term diet and they're certainly in a caloric deficit. And so there's all these other items that people tend to attribute all the benefits they got from, you know, the one item they chose to restrict in.

And as you mentioned, you know, that's really not the case and it's an important understanding to have especially, you know, if you guys are personal trainers and speaking with clients. I'm sure you've seen many people will come in with that sort of issue, you know, 'hey, I cut French fries out of my diet and I dropped a bunch of weight.' Oh yeah, you know, it wasn't French fries in particular, it was probably combination of many of the things you were doing. And so that's sometimes a difficult mental barrier to jump over because I've seen that myself, you know, doing one on one nutritional counseling.

It's an interesting dynamic to deal with because, you know, you certainly don't want to disparage anyone's individual and personal thoughts, right? You want to keep their beneficial momentum going but you have to find a way to educate them as to what's really having an effect. And it's a tough balance to play when you're dealing with one on one consultations.

Danny Lennon: So given some of these and some earlier point to raise, Jake, particularly around your approach of really the goal from a practical perspective is, the more we try and minimize the amount of sugar within the diet we're leaving kind of more room for higher quality nutrients and all the various things we've discussed. And so as opposed to thinking we have this cutoff and you can eat up to that amount of sugar and that's the -- you're perfectly fine, trying to just minimize to what you can it can be a beneficial approach.

With that in mind how would you respond to some people who would tend to discuss the allowance for certain high sugar items in the diet as something that's useful for people from in durance or compliance perspective in the long term? And by trying to get someone to completely minimize their sugar intake or to rely solely on whole foods can make it more likely they won't adhere to the diet and therefore cause just a worse outcome in the long term.

Jake Meys: Another really outstanding point to bring up. So, you know, we talked a little bit about kind of that insulin resistance situation or someone that wouldn't maybe be of let's say, you know, pinnacle health, you know, let's move that to a completely different context. As you're mentioning someone maybe that's an athlete and looking to recover very quickly between bouts of exercise or maybe someone that's an in durance athlete and really needs to optimize their performance. This is when sugar really shines, right. When you need to get large amounts of sugar to the muscle tissue to replenish their glycogen, to make sure they have the energy they need to move forward.

Even in sporting situations helping with hydration. There is such a beneficial spot for sugar in these situations when people have specific athletic or performance needs to utilize it. I would certainly never want to discount that sort of amazing benefit. So it's really important to keep in mind, you know, what's the overall context? Are you a competitive athlete? You should definitely be trying to utilize sugars in the most appropriate way to reach your performance and nutrition goals. If you want to compare this somewhat to, you know, we talked about postprandial glucose excursions maybe being a negative impact of sugar. You don't see that in really healthy individuals.

So these athletes when they consume a large amount of sugar their blood sugar actually won't spike nearly as high as if someone that was less healthy ate half as much sugar. So what happens is when they consume the sugar, yes, it gets into their bloodstream? But their muscles are so insulin responsive and so responsive to the increasing glucose in their blood the muscles suck it right up and utilize it very quickly. So you don't actually have the same negative effects even available physiologically for these very healthy individuals.

So that's when sugar, not only has a benefit but also does not have a detriment. You don't have to worry about items like advanced glycation because your blood sugar just doesn't spike very high. So it's certainly a completely different story when you begin to talk about people utilizing sugar to improve and optimize their, you know, personal performance and athletes that have some just really profound healthy glucose metabolism that is ready and willing to take advantage of the sugar that you're giving it.

Danny Lennon: Right. So what if we were to take a hypothetical example and again there could be a false dichotomy in here. But for illustrative purposes at least, let's say we take someone who is very overweight maybe even obese and they are going to -- or they're working with someone or they're embarking on a diet themselves. And they decide that they are going to include plenty of what we'd class like high sugar foods or junk foods that still fit in with an overall calorie and macronutrient intake that's going to allow them to lose body weight.

How do we think through this example because we know on the front end that simply losing some of that body weight is going to lead to a improvement in health and a lot of their health markers improve simply by that loss of body weight? But there are these background things you discussed of not only from a behavioral standpoint but also potentially long term health with the more and more sugar that's included in the diet. How do we talk to someone who says, "Well, I just feel it's going to be more likely I stick to this caloric deficit long enough to lose that weight if I can include more of these foods whereas if I try and restrict and only eat whole foods I may run into some difficulties.

And again, like I said, that could be a false dichotomy because it could be -- come down to, we could set it up in a different way. But how do we at least start thinking through an example like that?

Jake Meys: And that's really an example that I'm sure is very common for any of you that are personal trainers or maybe registered dieticians trying to work with individuals to improve their health and wellness. So from my perspective, the best approach to that is to; one you need to optimize compliance and you need to make sure that if someone is dieting it has to be somewhat of a positive feedback mechanism for them, meaning if you feel too restricted

on a short term diet that's really when we start to see the rebound weight gain effects after they do something like a four week or eight weeks or diet.

So if they're utilizing sugary products to keep them happy and moving forward on a lower calorie diet that they wouldn't normally be able to obtain, I think that's a good start. But the point I want to stress as a good start you have to keep in mind a long term goal is going to be to minimize that sugar intake and it's going to be to replace that with other healthier items that is going to help promote the maintenance of a healthy body weight like we know fruits and vegetables do. It's going to be there to help promote consuming important nutrients not only fiber and protein but phytonutrients as well like we know the fruits vegetables and whole grains do.

So if you're using that as a stepping stone I think consuming small amounts of sugar even if it's built into the diet is somewhat appropriate for these individuals to get them moving in the right direction but I think it has to be with constant follow up and always the push to say how can we continue to improve? You're starting to receive your results on your body weight, that's outstanding. Keep moving forward, you know what, we're still eating two candy bars a day, can we move that down to one? Can we move that down to two candy bars a week? Can we move that down to one candy bar a month?

And then you've given someone the power to really change their habits especially once you start getting to that three to six month mark of really replacing those sugary foods to healthy fruits and vegetables that gives them the power to go out on their own and really make sure that long term they have the healthiest nutrition. So it does have a place for some individuals in terms of keeping them on an appropriate diet. But in my opinion it has to be under the context of how do we eventually minimize this? And that's going to be the best way to set someone up for their own independence to reach their health and nutrition goals.

Danny Lennon: Right. I think that probably leads us to a kind of conclusion of where people can sometimes conflate something. Like we know that based on someone's caloric intake that someone can lose weight whilst eating. Let's say a high proportion of junk foods and really we could give a hypothetical scenario where someone only eats processed junk food and can lose weight over a certain

period of time. And that weight loss can be healthy but not conflating that with any of those food choices being quote unquote healthy choices and I think the same thing applies here that we can get someone to if they can stick to it and allowing some amount of high sugar foods and a certain amount of sugar within the diet to get them there.

That is a healthy process they're going through because they're improving their health but the actual -- each of those meals where they're consuming these high sugar items is not necessarily a healthy decision. And I think there's a slight difference in how we can view those, I guess.

Jake Meys: Yeah. I really love that you use the quotations to describe, you know, healthy food and healthy decisions because I do share that same sort of concept where I really don't like viewing foods as having this dichotomous role of this healthy versus unhealthy. There's good versus bad, you know. They certainly all have their own role even if it's just for you know enjoyment, right. We know that food is not just fuel. I know a lot of times in the athletic community there's this concept of, you know, food is fuel. But we know food does so many other amazing things for us. We use it for celebrations, right. We use it to -- when we're around family and I'm sure everyone has their own certain food that, you know, one of their old family members always makes.

And if you're at some sort of holiday party you know it's going to be there and boy, is it delicious. It might, it might not be the best choice for your short term insulin sensitivity but that's okay because there's more to food than just calories and macro and micro nutrients. And I think that's an important thing to remember is the social aspect of food itself. And I really like how you kind of drew upon this issue of sugar and how the context really matters especially particularly because, you know, Danny I can't recall if we chatted about this but there was a New York Times article that came out about the food products that we're using in hospitals having sugar in them.

So for, you know, for maybe people that aren't' as familiar, you know, as a dietician working in the hospital you have individuals coming in that really are not consuming enough food. So we give them nutritional supplements to make sure they have the protein and energy that they need for the body to heal and recover, you know. One of the premier products we use is Enteral or maybe

your listeners may be familiar with Abbott Nutrition. They make Enteral they also make things like baby food like Similac or Pedialyte.

Athletically, you guys might be familiar with like the protein powder EAS, I think. I'm not the advertising for Abbott but I think it's important to highlight the range of this company and this New York Times article was putting them in this really negative light for having sugar in their nutritional drinks that we have in the hospital. The concept was, why are we giving, why are we giving sugar to our hospital patients, you know? We should be giving them whole food yogurt-based products and whatnot. And I was really appalled at the article because, you know, in certain situations when you have people in the hospital, they're not looking to eat, they don't feel good. How do we get them the best nutrition?

And so these Enteral shakes are designed to have lots of protein and vitamins and minerals and nutrients. And of course they use sugar to increase the palatability of these nutrition shakes and help these individuals eat when they don't want to eat and get the but get their body the nutrition they need. So that's just another situation where, you know, building sugar into these formulations -- these were not random, you know, meal replacement shakes that were put out there. Abbot Nutrition is one of the premier nutrition supplement organizations certainly in the world.

And they really do outstanding science and research behind all their products. And so, you know, there are certainly different situations where sugar has this beneficial role and I think it's important to highlight that in the context of, you know, when we need someone to eat extra calories sugar also plays a good role. Even if it's not the best for their insulin resistance, that's not what's important at the time when they're sitting in the hospital. We need their body to recover from whatever put them in there.

Danny Lennon: Yeah. That's a phenomenal point and I think it's this idea of if you isolate one nutrient and think is this good or bad and look at it in that black or white context you can -- in this case you would fall down say well, of course it's bad, has no real nutritive value. But really we're looking at what is the net positive or net negative. And in, like you say in this case, clearly the net positive is going to be there because even though there is triggering this that's

allowing them to be able to consume the food that they need to that they otherwise wouldn't get.

And I mean, even from a practical perspective of people working with clients you could think of this in someone who has traditionally never eaten any vegetables and is very adverse to the taste of them, maybe by having a small spoonful of ketchup along with those vegetables to start with even though “it would be bad because of sugar and preservatives or so on” that is having the net positive of the getting the person to eat more vegetables. And so I think looking at this as a net positive or a net negative as opposed to isolating one nutrient on its own, is where we can run into problems which I think has been this discussion has come up or this theme has come up quite a lot in the points you made so I'm glad that you discussed that. In addition to your previous point I did want to revisit of looking at the healthfulness of our diets as something beyond simply the nutritive value of them. That’s something I've certainly echoed before and I’m fully onboard with.

So with that in mind Jake, one last thing that I wanted to just pull back on because I forgot to mention earlier that kind of relates more to the -- maybe looking at the literature in this area and trying to come down on where some of those cutoff points have been. I have looked out of what a good or a bad or a higher a low sugar intake is in people trying to work their way through this. Presumably when we look at a lot of the studies in this area and they see an association between sugar and let's say cardiovascular disease or risk of other chronic illness. At least in a number of the trials we’ll tend to see something like 25 percent of calories coming from sucrose or high fructose corn syrup and seeing a negative outcome.

And I think it's easy for people to dismiss that and say, “Well, of course when you have something as high as 25 percent of your calories,” and maybe missing the nuance that in certain trials you need to have a large enough difference between the lower end and the higher end to actually see a significant result from that particular trial. Can you maybe touch on how or some of the things people shouldn't be dismissing when it comes to looking at this research or at least maybe some of the things the objections you see posted to you about some of the objections people have when you try and present evidence for maybe we should be trying to minimize sugar intake within the diet.

Jake Meys: Sure. So, you know, in terms of setting up study designs and developing proper protocols to see a difference and answer a specific question. I'm really glad you brought up how, you know, to be able to realize the difference studies have to be set up to the use certain cutoff points. And I think it's really difficult to take any sort of these individual research studies and then try and just take that single study and apply it to a long term real world situation, you know. Opposite to this is the issue with the epidemiologic work where we get these really huge data sets that describe sugar intake over a variety of different demographics and health situations.

And so what you can do is you can take those two different scenarios and put them together and say, you know, are they both saying the same story? Are they both saying that sugar intake is having an overall negative impact? And I think when you group them all together and you can kind of say you know what, yes. We have short term trials that say, you know, sugar even in large amounts, if that's what we have to use to make that evidence. Sugar has a negative impact on various health parameters, cardiovascular disease risk, insulin resistance, et cetera.

Okay. Let's look at another group. Let's look at epidemiologic work. Well, what does that say? Okay. What does that say? Well, that also says that sugar is having a negative impact. Let's look at some mechanistic work. Let's take cells, let's douse them in sugar and see what happens. What does that work say? That actually says that sugar is also having a negative impact. So regardless of the minutia behind what these different types of studies are showing, when you look at the whole landscape and you put everything together and all these different areas as a general sense are saying yes, sugar is having this negative impact on our health in our physiology, that's when you really have to take notice.

And you really have to think, okay, is this one study that I picked holes in really representative of everything? In my saying, you know, you don't have to have 20 percent of your diet as sugar to have a negative impact and because this study used such a high amount of sugar then sugar probably doesn't have a negative impact at lower amounts. That's not the best sort of logic, this concept that you can just poke holes in any individual study and

dismiss any sort of finding. You have to take everything in terms of the entire landscape and put it all together like I mentioned. And I think that's when you really see oh okay. It's pretty clear now that sugar has a negative impact on our physiology.

Danny Lennon: Sure.

Jake Meys: When you get to the point of determining some sort of cutoff, it's really hard, right. Because as I just talked about, there are issues with all these different approaches in terms of finding a single cutoff that fits for every single person and we could just recommend. And that's where we have to lean on, you know, in the United States or the dietary guidelines for Americans and use that group of professionals in the area that looked at all this research and came up with these guidelines. It's a combination of evidence-based research and high quality professional opinion that kind of develop those cutoffs.

So, you know, if you're looking for something to go on, I think that's why we're probably as mentors. However I would put the caveat under the -- the goal is always to minimize, you know, if there's an upper limit or a maximal for something, that doesn't mean that there's not benefit to going lower and lower. They just kind of develop these guidelines for large scale grand schemes sort of recommendations to give people something to have that as tangible some sort of goal to stay below. So that's what I would kind of lead towards, is this concept that when you put all the research together and you look at the professional opinions, that's probably the best cutoff we have.

But I'm not sure I would say that that cutoff is particularly relevant in any independent scenario.

Danny Lennon: Yeah. That's an extremely important point that sometimes can be missed that putting out public health messages is extremely different from individual advice that someone should be given or follow. It's just a completely different sphere and that's why I have a hard time when sometimes people are overly critical of public health messages and saying, "Well what about in this scenario or this scenario?" It's like it's not designed to account for individual scenarios it just, it can't do that. And trying to put together public health messages is extremely difficult and certainly a job I don't envy in any way. So I think just being aware of that difference of public health messaging versus individual

advice completely changes the game in terms of recommendations.

One thing I did want to just clarify for people Jake, is when we talk about this idea to minimize and that can be a process that happens over time. But even to minimize as opposed to thinking of that as the goal being zero grams of sugar necessarily it's more a fact of how can I eat in a healthy way long term or getting enough of all the nutrients that I need that I'm eating as a low amount of sugar as I can realistically do and get by on whilst maybe not going crazy or having to be overly restrictive? Would that be a good way to frame that or how do you think of that idea of minimizing intake?

Jake Meys: No. That was a perfect clarification. I'm really glad you mentioned that.

Danny Lennon: Okay. Perfect. So with that I think we've got through quite a lot of things here and certainly some that we've only scratched the surface and I could probably spend a few hours talking to each one with you. So I think we'll definitely have to do around two if you're game for that. But before we get to the final question or so, for you, of all the stuff we've looked at today and I know we've jumped around from different things, what are maybe one or two of the main takeaways that you'd like to leave people with that you think are the most pertinent points to any of the things that we've discussed?

Jake Meys: Well, guys number one I would say when you're reading research or going through comments, the first thing to remember is you can find any study to prove any single points and I use prove lightly. So keep in mind the utilization of systemic reviews, professional opinions, dietary guidelines, that's a conglomerate of all that information. In terms of the sugar intake itself, you know, focus on your fruits and vegetables. I like to stay simple with it. If you're eating a chocolate bar every day and you can replace that with an apple and just slowly do that over time. Long term like even that apple is going to be a better habit. So that would just be my final takeaway is back to the basics. Eat your fruits and vegetables every day, you'll be going in the good direction.

Danny Lennon: Awesome. And Jake, for people that are looking to follow you online and keep up to date with stuff that you either publish or

just post on social media and so on, where are some of the best places for them to go?

Jake Meys: Yeah. So if they're interested in the work that our group or myself is putting out, you can just go on Pub Med and put in Mey, M.E.Y J.T. And you can see the stuff I have currently out there. More importantly is probably my mentor's name which is Kirwan, J.P. K.I.R.W.A.N J.P. And you can see all of the outstanding work that he has really given momentum to over the years. In terms of social media my favorite place to go is Twitter and I'm @CakeNutrition. If you want to see some opinions that are probably a little dicey and a little against the grain, that's just my style.

So I have a lot of fun on there and I like interaction, so that's all great. If you do have a question that you don't necessarily want to throw on a public forum, I can certainly be reached by e-mail. Maybe one of the easiest ones is just Jacob.mey@pbrc.edo. So first name dot last name at Pennington Biomedical's email address. So I am happy to fill any questions, I love talking to individuals about these stuff. It is on my favorite things to do so Danny I certainly can't thank you enough for letting me get on here and just chat about this sort of stuff with you. I've really enjoyed your opinion over this little talk. It's been a blast on my own.

Danny Lennon: Yeah. Straight back at you. This conversation has been great and like I said we will definitely need to organize a second round two where we go even more in-depth in some of these topics because that would be awesome. And for everyone listening I will list everything that Jake has just mentioned in the show notes for you including a link to some of the research papers we talked about as well as his social media handle and all the other stuff just mentioned. So with that Jake, that brings us to the final question I always end the show on. And this can be to do with something even completely outside of today's discussion topic. And it's simply, 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?

Jake Meys: My one thing would just be sit back and enjoy life. It is way too short to be worrying about a lot of minutia and whatnot. Just sit back and enjoy it.

Danny Lennon: I love it. Perfect message and a great way to round this thing out. Like I said I want to thank you not only for the information you've given today and the work you're continuing to do but just for taking the time out to come and talk to me on the podcast today. It's been a pleasure.

Jake Meys: Awesome. Thanks Danny. Definitely going to do it.

Want to support the podcast? Here's how…

1. Leave a rating/review on iTunes: LINK
2. Support us on Patreon: LINK
3. Post on Instagram and tag: @sigmanutrition and @dannylennon_sigma