Introduction and Speaker Background

Hi everyone. I'm Doctor Sanjeev Goyal, and you're listening to the advanced Anti-Aging and Technology Summit. And today I have Doctor Ryan Lawrie with me.

I'm so excited that you're here. So we're going to be talking about, ketogenic, lifestyle and the impact on aging. So, yeah. Let me before I do that, I want to just give the bio.

So, let me just let me go through that first. So, doctor Ryan Lawrie is the CEO of ketogenic.com and president of the Applied Science and Performance Institute in Tampa Bay.

He has published over 150 papers, abstracts and book chapters on human performance and sports nutrition and is heavily focused on the impact of ketogenic diet.

I was just reading you have the ketogenic Bible. I was just going over that just this morning. It's pretty awesome. Ryan has received exercise, exercise Science Scholar of the Year award, NCA Award for Outstanding Presentation of the year Award, and National AHP Exercise Science Major of the Year Award.

Ryan coauthored the book Ketogenic Bible alongside his partner, Doctor Jacob Wilson, which focuses on the science and practical application behind the ketogenic diet, exogenous ketones, and all of their potential applications.

So welcome again. Thank you so much. So maybe let's just I know I don't want to spend too long on this, but I think people should understand how you got into this field and like why, you know, I know you have a bit of a personal story on that, so maybe just just give us a the viewers a little bit about that. That'd be great.

Yeah for sure. First off, thank you. It's an honor to be here. I'm super excited to be joined the summit. Yeah. For me, and like many of you who are watching this, we all have, our own story.

For me, that was my grandmother. She passed away way too young. She was type two diabetes, had heart disease and was obese. And she passed away when she was just 61 years old.

And being a big Italian family, the grant your grandmother like the rock of it. Right. So that took a big toll on my entire family. And so I made it. My mission is set out.

And I said, you know, I don't want other members of my family, and I don't want other people to have to go through that same tragedy or that that same challenge that we went through.

And so I thought about, as I said, you know what? Exercise is great. I love exercise, it's super important. But like, as much as I want to convince my mom to go resistance training, sometimes she's just going to be like, sweetheart, I'm not, I'm not doing it.

But we all right? So I was like, you know what? Let me focus on nutrition. And so that's where I went to University of Tampa, I met Doctor Jacob Wilson, and we started studying nutrition.

And over ten years ago I had no idea what keto or ketosis was. And then I started hearing about it. You have to eat sardines and stuff. And I was like, oh, the sounds or the sounds awful.

Fast forward after I was done playing baseball, after I, after I got done with my master's, I was like, you know what, let me try this, let me try this keto thing and really figure it out.

And from there I was hooked. I messed up a lot in the beginning. I made a lot of mistakes because there wasn't as many resources as there are today, and then kind of figured it out over the last decade.

What a Ketogenic Diet Is

I ended up dedicating my entire PhD to it and studying some of these alternative applications beyond just what people think weight loss with keto and continue today to to just study it and be super interested in the topic.

Wow. Okay. That's that's awesome. I have a bunch of little questions that I'm particularly interested, but maybe just for the viewers, just like a couple of minutes about what is what is ketogenic diet and, and how it works.

And and that would be really awesome. Yeah. Yeah. So you typically hear o a ketogenic diet is this ratio of fat, this ratio protein and this ratio of carbs.

In simplest terms it is a lower carb moderate protein, moderate to high fat diet. Right. The way we describe it in the book is any form of eating in which your body switches from primarily running on glucose and carbohydrates to fat and ketones as its main source of fuel.

There's a million ways to do keto million ways, but generally it's like I said, lower car, moderate protein, moderate to high fat diet. And most people, what we've seen is a lot of people think, oh, I'm going to do a ketogenic diet for weight loss, and they end up staying for a lot of the other benefits that ketosis can provide.

When your body is now running primarily on, you're still utilizing glucose to a little bit of a degree, but primarily running on fat and ketones as its main source of fuel.

And there's a whole host of benefits that I'm I'm sure we'll talk about. Yeah, we're going we're going to get into some of that for sure. So maybe, I would like to hear I'd like to talk a little bit about, the impact on, on inflammation because this is about aging.

So maybe, just maybe just tell us a little bit, what are your thoughts about how, ketogenic lifestyle would impact aging and what's your what's the research saying so far about that?

For sure. And, there's not much human data, right. We wouldn't be around to see it. But, there is some interesting animal studies where they've, and we've actually done one and I'll talk about that.

But before we started doing research on it, they were actually doing studies in C elegans where they were literally taking these C elegans and bathing them in ketones and seeing that they actually extended lifespan when they were in this constant state of ketosis.

No other variables changed. And so that was like, what's going on here? And I'll talk about the mechanisms by which you mentioned one of them, the anti-inflammatory aspects.

There's also other signaling capabilities that ketones have. But we set out to do it. So we said, you know what? Let's do this study where we basically took animals, we fed them a Western diet.

We fed them like a standard calorically restricted diet. And then we fed them a ketogenic diet, and we started feeding them at what would be the human equivalent of, say, 25 years old.

And we just let them eat that way the rest of their lives. So we carried it out until the animals basically died. There's a clear sense, right? What is the what exactly what animals this was in mice.

Oh, mice. Okay. Good. Yeah, yeah. So this was in mice. So we carried it out until until they died, dissected. Looked at all the organ stuff. And there's it was crazy.

And this was one of the biggest game changers for me. Is like, after they were after all of them died, you cut them

off and then, like, the ones that were on a cage that literally look like something out of a textbook, very little visceral fat around the organs is still look clean.

And this is like, these were old. They were like human equivalent of like 100 year old mice.

Ketosis, Aging, and Longevity Research

Whereas the obviously the standard diet still had a little bit of fat because but they didn't have much because they were calorically restricted their entire lives like this.

The, the Western diet that was eating a ton of calories, it was a ton of visceral fat, tons of information, etc.. So as you can imagine, the ketogenic diet group lived longer.

And on average they lived longer than I think it was like 27% longer than the Western diet or the standard diet. And there was just a lot of interesting things that we took away from that, one of which is the one of the primary mechanisms by which we think ketones and being in ketosis, or that can help with aging, is ketones act as something known as histone deacetylase inhibitors.

So the easiest way I explain histones and histone diseases, because it's a it's a challenging word to even get out, is like imagine cells inside of our bodies have like light switches and our genes have these light switches.

As we get older, a lot of these light switches start turning off right. And these histones come this with age, right. That that's a normal kind of aging process that these histones are like coming on top of the DNA.

Is that what's happening like in a blanket? Is that exactly normal aging? It can be accelerated by a variety of things, right. Your environment, smoking, lack of exercise, poor nutrition, all these things accelerate how quickly the lights turn off.

But normal aging as we get older, a lot of those start to turn off. Ketones act as these stack inhibitors, where they basically stand. I say like, imagine a bodyguard standing right next to a light switch and being like, no, you're not turning this off right now.

And it keeps a light switch on. And that's what we're seeing. And there's a lot more data coming out about ketosis in particular, having these like longevity, effects acting through this mechanism.

So that's so interesting. Let's say if the if the light switch is already turned off, can it turn it on. That's great. But we don't know. That's a great question I don't know I don't know if we know that, I don't know if if it's been shown to, if they can turn certain ones on or certain ones off.

That would be really interesting to, to look at that. Right. So, so I guess that that's so it's, it's really on the DNA level that we think that this ketosis is having an impact.

And, and so maybe we're just jumping ahead. So something like exogenous ketones, do we think that that the benefit is that happening at that level because it's just the ketone ketone molecule, our body that's that's it.

Could there's a lot to unwrap with exogenous ketones because there's a lot of junk and stuff that's being claimed. That isn't really necessarily true.

But if you give the proper form of ketones, you give the the right dosage, the right form. Because, I don't know if you want to dive into this, but like with ketones, there's chirality.

So one of the best ways I explain this is if you've ever heard of the amino acid leucine, right. I'm sure everyone here has heard of leucine. When you supplement with leucine, we utilize L leucine.

It's it's leucine. There is a D leucine but no one utilize it. It's not bioavailable. It doesn't get taken up by our bodies

and utilize, and in some cases when it comes to like certain drugs, you're using the different enantiomers.

Some actually can have adverse effects, which is why you use the other. And the answer when it comes to ketones, it's the same thing. There's a D form and there's an L form.

A lot of the ketones that are out on the market, that ones that even that are being utilized in research are a mixture of 50% D, 50% L. Well, what our bodies naturally produce and make is d very little L is produced inside of our bodies.

So D is in an atom or the isomer that we should be utilizing in studying and research. And when you see the ketone ester research, most of them use primarily D.

But when you see ketone salt research a lot of them use 5050. So that's why there's so much uncertainty or unknowns when it comes to exogenous ketones, because there's still a lot of confusion on the market.

But to answer your question, I mean, if you're using the right form, you're using the right amount. We've studied different varying dosages in our lab.

We actually just completed a 90 day toxicology study with varying levels of, exogenous ketones. You can have benefits. And a lot of those benefits that we're seeing in our laboratory are on the brain.

Not necessarily like I'm going to drink ketones and and instantly going to melt fat off of my body. It's more like we're seeing benefits for like, neurological applications, better focus, better quality, increased reaction time and some of these different areas.

Well, let's just rewind that a little bit. So the, the UV, we want the d we want the d isomer of beta hydroxybutyrate I assume is that is that correct.

And and so I know are you allowed to tell us like where we should be going. Like I mean it's there's many companies out there. I myself are drinking a prove it ketone broth.

But maybe if you could just kind of and I've seen the esters like there's some some out there these companies hard to find like tell me what what you would recommend to the listeners.

Which they the proof. It's the only company that really uses that 100% de all the other ones, we use a mixture of the two. And when it comes to ketone esters, I wish this wasn't the case.

But when it comes to ketone esters, they're super expensive. Like I said, they're pretty hard to find, and the taste is just brutal. Like it's gotten better over the years.

I tried, I tried an original, ketone ester. The ones that were being studied in, like, the 2000, early 2000. And that thing tasted like my great grandfather's great grandfather's gin.

Now it just tastes like my my grandfather's gin. So that's that's kind of a little, perspective for you, right? Okay. What about, impact on, like, cancer?

If you want to just. I know you have a whole chapter in your book about that, and you just take tell us what what is the research showing us right now?

Yeah. And there's there's been a lot more recently, especially with brain cancer, and breast cancer, there's been some, some a lot of work done. But, yeah, I mean, one of our colleagues, Doctor Thomas Sifry, has been doing a lot talking about the metabolic therapy of ketosis for targeting cancer.

And in general, what we know is this cancer cells, due to their dysfunctional metabolism, thrive off of glucose. And so the question is not that a ketogenic diet should be the be all, end all, but why not use it as an adjuvant to

standard of care?

And what we see even with just fasting or keto. But there are studies specifically with fasting that if they take patients and they fast them for a prolonged period of time before some of these, like chemo or radiation, the dosage that's needed is a lot less to get the same effect.

The cells are the cells in our bodies become more sensitized to it, possibly through lowering glucose. You're giving less food or less energy for the cancer cells to metastasize size and keep going and growing.

So, theoretically there's a lot of promise there, but, definitely some more work to be done. Okay. You know, I get this question a lot. I have this as well.

This, you know, people can eat a low carb diet, let's say maybe it's 100g or 50g of maybe 100g of carbs a day. And so is the what's the difference. And are they not getting the benefits.

Well, how much benefit they're getting? You know, if somebody is very active and burning a lot of carbs, are they going to be okay with they're going to have some ketosis anyways.

Yeah, it's super individualized. So if someone I know people who have eaten 100 to 150g of carbs a day and been in steady ketosis, but they're like usually have a lot of muscle mass.

Super active for your general person who might be not as active, sits around a lot, or works like, more of, a sedentary job, they probably wouldn't be able to get away with that.

Now, I say this, it's I always say, don't mess it up for perfect. So if you're going to go, if you're going to eat 150g of carbs and like, that's a you were eating 400g before, that's great.

That is a huge win. Like I tell people, the goal is to get people to become more carb conscious. I don't even tell everyone they need to be eating keto, right?

Even though I've been eating it and we educate on it, I don't think every human being on the face of the planet needs to be keto. I think We All can Take strives to become more carb conscious and stop eating a lot of these refined, processed carbohydrates that are just junk on the market.

But are there additive benefits to actually being in the state of ketosis? Yes. If someone is kind of sitting on that fence where you're low carb but you're not fully into ketosis, you might be like having some brain fog.

You might be like, oh, this is brutal. And a lot of it is because you kind of haven't gotten over the fence on it where you're really able to tap into your fat stores, really able to ramp up lipolysis, to produce ketones at a high enough level that you're full or you're not as hungry all the time, which these are common benefits that we see in individuals who are in ketosis.

That's very interesting because yeah, I've, I've had that issue where, yeah, it's it's very difficult, at least at the beginning.

Exogenous Ketones and Product Differences

We call it keto flu, I guess. But you're saying that if you just stay in there, if you're just staying like around that hump, you don't necessarily, get over these symptoms.

What you're saying you kind of. Yeah. Stick around. It becomes difficult to. I like to use it. I say the analogy of, like, sitting on the fence, like it's not very comfortable when you're straddled sitting on a fence.

It's like, well, your your body isn't getting a ton of glucose and carbohydrate. It's from your diet. Yet you're not fully keto adapted. So you're kind of waning back and forth between the two where like you might be tapping into

glycogen stores, but then you're like, I need to tap into lipolysis.

And it's like, it's not really happening to the degree that you would. So, I would say it's a better step to ease in, but either, that would be the next step would be like kind of get over that fence and go on in.

I was just listen you know Peter Deer on his podcast and he had a whole thing on Fat Flux just recently. He was talking, he was saying that, that this lipolysis is the amount of lipolysis we have is, is a function of insulin, you know, insulin resistance and things like that.

So can you tell me how is the keto adaption, what exactly is happening physiologically, and how does it make it, make it, does it make it easier for this lipolysis to occur in the cells?

Yeah. So keto adaptations are very interesting process. There are ways to speed it up that we've kind of studied it in our lab. But really what's going on is imagine that all of us have, a finite amount of glycogen, which is our stored form of carbohydrates that we can store.

Right? We have some in our liver and some in our muscle tissue that, that we can tap into. Well, as we go about our day, especially as we tap, we start doing exercise, we start depleting that glycogen.

Well, as we kind of keto adapt, you're not consuming as many carbohydrates, so you're depleting that glycogen. And there's not very much being replenished early on.

There's some studies showing that our bodies are very smart. And the longer we've been in ketosis, we can actually still replenish our glycogen, which is a whole nother animal.

But we start depleting glycogen during ketone adaptation. And so our body starts ramping up because like you said, insulin's low. We're ramping up this process known as lipolysis to increase ketones start tapping into our own body fat, burning that body fat at a rapid rate, in which we're increasing ketones to now provide the main source of fuel.

And there's ways you can accelerate that. You know, periods of intermittent fasting can accelerate that. One of the things that we saw in our laboratory is high intensity interval training.

So doing like all out sprints, like we used a Wingate bike, but even just a spin bike or even just doing a running sprints, high intensity interval training can speed that process up, because that form of cardio depletes muscle glycogen levels very quickly.

So the quicker you're able to deplete those and get over that hump, the less likely you will be to experience those negative symptoms that people talk about with, you know, so so the negative symptoms are coming from what.

Sorry. Just explain to me. So then yeah. So the glycogen gets depleted easily with the high the hit. But how does that help with the removing the negative symptoms.

So there's two to common things that are responsible for keto flu. The one the one that the high intensity interval training will help is it gets you over the fence.

Kind of like that analogy I was using before is like rather than straddling it where like your glycogen hasn't been depleted enough and fat burning hasn't been ramped up enough, you're still sitting there, you're depleting glycogen very fast.

So it's kind of like a little kick over the fence to go like, hey, let's go more towards fat burning. That's that's the one thing is you need to ramp up, this ability to burn fat quickly and be able to get ketones high enough to be able to provide a fuel for your body.

And then the second thing that often happens with the keto flu is electrolyte imbalances. So whenever you lower

insulin, whenever you're eating a lower amount of carbohydrates and you lower insulin, things change inside of our bodies.

And one of the things that changes is how we excrete out or how we handle electrolytes. So we start excreting out things like sodium, calcium, and potassium at a much higher rate.

And so what often got demonized in our society, like sodium, it wasn't the sodium that was the issue. It was the large fry that had a ton of sodium in it because what happens when you eat that large fry is you're getting a huge glucose response, huge insulin response.

And on top of that, yeah, you have a huge sodium load and your body's not excrete. And it's doing the opposite. It's storing it and holding on to that.

Where ketosis changes that your insulin's low.

Ketogenic Diets for Cancer Support

You're excreting this out very rapidly, which is why we recommend like salting all your foods, making sure you're getting in these electrolytes like potassium, eat like half an avocado a day.

That's a great source of potassium spinach to get some magnesium or even just supplement with a good quality electrolyte supplement, like to help boost it.

But those are some things to help get over that process. Okay, that makes sense. Okay, so, what about, like, vegan ketogenic? What about vegans? What can they do and how can they, still do a ketogenic diet?

Yeah. It's tough. It's a lot tougher to do vegan keto. It's possible. One of my good friends, after Roll Call wrote a book called Keto Terry, and it was more of a vegetarian approach, to Quito, but to kind of go over into full vegan, the thing I would say is, like avocados are going to be a huge, huge staple, things like tofu in moderate amounts.

But again, it's it's the thing you need to focus on is getting in good quality sources of protein. So and that's often with, with a vegan based diet that is a little bit of a challenge.

So you might need to supplement in, especially if you're trying to do vegan keto, you might need to supplement with some of these important amino acids things like the branch chain amino acids, leucine, use vegan based sources to supplement those in to make sure you're hitting that protein threshold, to make sure that you're not only holding on or holding on to muscle, but hopefully gaining it as well.

Right? Right. Okay. What can one do to, let's say, you mentioned fasting, so intermittent fasting and so on. How is this being used in conjunction with a ketogenic lifestyle?

Like what do you recommend, mean? Because they're kind of working in some ways. Similarly. So what do you think is what do you do for yourself or what do you recommend others?

Yeah. Do them in their life. So I like to say I tell people to meet them where they're at, like, if someone's coming off of a standard American diet and eating eight meals a day, I don't think the best approach is to try and get them to fast for two days, right?

Like that's going to be very difficult for them to do. Like a water only fast for two days is really hard when you're used to eating 16 meals in that time period.

So I say like, listen, if someone's just eating three meals a day every single week, maybe twice a week, ask them to bump out the breakfast and just say, hey, instead of having a breakfast, let's just see if we can get through to lunch.

Because for some people, a 14 hour fast is a long time, like a long period of time. And a lot of it's mental. Sure.

Where we've been programed and to kind of say, you know, we need to eat every two hours and we have foods that are hyper palatable that make us go, oh my gosh, I'm hungry again.

I'm hungry again. Or at least think we're hungry.

Low Carb vs. True Ketosis

So it becomes challenging. Personally, where I'm at right now, I do a 24 hour fast once a week. So I do what I call Metabolic Mondays. I eat dinner on Sunday night, and I don't eat again till Monday night.

It's a it's an easy process for me. Because, Mondays are usually a busy day for me. So I just eat and then I'm like, oh, it's already like 5 or 6:00 at night on Monday, I just eat dinner typically during the week, I intermittent fast.

I don't even count the hours because I don't think you need to be like, oh, 18 hours in one minute. I don't think it needs to be that rigid. I tend to eat two meals a day.

Tuesday, Wednesday, Thursday, Friday. And then on the weekends, I typically have three meals a day. That's when I might wake up and I might make my keto pancakes or keto waffles or something like that.

Just because I'm a little bit more active. I usually take my dog on a walk or a hike or something like that, but, I'm flexible in that regard. But that's kind of a typical protocol for me.

Okay. Okay. That makes that makes complete sense. So let's talk a little bit about, exercise because that's and and, and, and so as people who are athletes or high performance, individuals, how do they incorporate this, the ketogenic lifestyle and the concerns probably about muscle loss and, you know, so I'm sure you've done a lot of research on this.

I read in the book to, some of the things, if you could just kind of tell us what what people how address some of these concerns, that would be great.

Yeah. And if you're a high level athlete, I honestly think it depends on where you're at in your journey and and also where you're at in your season, like, I wouldn't recommend most high level athletes try and start keto in the middle of their season, right?

Like this is something that you probably need to get adapted to prior to your season. Otherwise you're going to go through. If you don't, if you aren't properly coached or working with someone, you're going to go through that keto flu period and you're going to be like, I had a terrible game, or I had a terrible run, whatever, and you're going to blame it on keto, but you just weren't adapted.

So it takes time for that process to happen. In terms of muscle, it was really one of the first studies we ever did. Oh, wow. It's about almost ten years ago, about a little over, Yeah. Wow.

So we did a study where we said, you know what? There was a lot of research out there that showed that you can gain muscle on a ketogenic diet, but the problem was most studies that looked at this or all studies at this point, they were basically letting the ketogenic group eat ad libitum, and they were letting the standard American diet eat ad libitum.

And so what a lot of people were saying were the ketogenic group was eating more protein. That's why they were able to gain just as much muscle like the like, oh, they were eating more protein, they were eating more protein.

And there was a famous study by Paola Antonio Paoli and, Italy with gymnast, and he saw that they were able to gain just as much more so, but they were eating a little bit more protein.

So we said, you know what? We want to control for this. So we did a study in resistance training, highly resistant trained individuals. We took them. We adapted them for two weeks, and then we fed them either a ketogenic diet

or, a Western diet.

And we matched for protein, made sure there was no differences between the protein between the group. We trained them three times a week for eight weeks.

At the end of that eight weeks, we we did a Dexa again. And what we found was both groups were able to gain just as much muscle. There were no differences in muscle mass.

Keto Adaptation, Electrolytes, and Fasting

But at the end of that, that ten weeks, the two week annotation and the eight weeks of training after that ten weeks, the ketogenic group actually lost more fat mass.

So they were able to gain just as much muscle, but they lost more fat mass over that same period, which was a really interesting thing. And kind of since then, there's been a lot more studies that have equated for protein and saw that a ketogenic diet can gain just as much muscle if you allow the proper amount of time to adapt.

Right. So this keto what the keto adaptation sounds like, it's key for somebody. So once somebody gets let's say somebody gets has, you know, been working on a low carb diet or just become more sensitive.

Is it like it's in a complete on and off switch to become keto adapted, or are you just gradually a person can become keto adapted and and then it's easier the next time when they like, is this what what do you what's your thoughts on that?

Yeah. And the longer you are in ketosis the easier it is to get back into ketosis. So like I see what happens a lot of times people will try to adapt for they say they're just starting keto fresh and they'll go two weeks keto and then they're like, screw this.

I'm having some of these symptoms, and then they go and have pizza and stuff, and then they're like, let me try this again. And they're constantly going through this vicious cycle.

Whereas like someone like me, I every month will have sushi, like, it's like my little date night. So like, we will go have sushi and it's, it's easy.

Like I'm actually back in ketosis. Regardless, I still I have the resistant starch for the rice, but like it's it's once a month. I do it on a day that I'm super active.

And so I literally have maybe a roll of sushi the next morning unpacking ketosis. So I'm able to adapt and clear that very, very, very rapidly, whereas someone else that might take them a whole nother week to get back in.

But that's just like, is that like years of like you think your body has like become now used to this? I think. So I think we are seeing changes in Doctor Jeff Volks done some interesting research looking at this.

With endurance athletes there are metabolic changes that happen like that might not happen in the first year while you're on keto, but like some of these runners.

And that's kind of going back to the glycogen talk that we were talking about. But these elite runners who are are fueled by keto. They're going on a diet for multiple years, are able to replenish glycogen to the same extent as people who are eating a high carbohydrate diet after race, despite not eating any carbohydrates.

Their bodies have adapted in such a way that I don't think you would get that same, process in the first 6 to 12 months. I think that's something that probably takes years for your body to go.

All right, now I know how to ramp up this, this gluconeogenesis from other factors that aren't muscle, tissue or protein that we think are other different markers to help replenish this glycogen.

How are they getting how are they creating the glycogen from protein. Like how's the how has that been created. Yeah. So it's really interesting. We've done some work and Jeff's done some work looking at this.

So what we found is that on a ketogenic diet you your body is amazing in that ketones helps spare the breakdown of important amino acids. And when I say important ones, I'm talking about like the essential or branch chain amino acids.

So it's not like your body's going, oh my gosh I need glucose or glycogen. Let me tear down muscle tissue. That that's really not what's happening. Instead, what we found in the animals was that alanine, like amino acids, like alanine, which really doesn't have much of a purpose other than to serve as a glucose genic substrate, gets really depleted on a ketogenic diet, like significantly lower than a Western diet, whereas the branched chain amino acids were different.

So our body goes, hey, here's some glucose genic amino acids. Let's use those to convert over. They can also utilize glycerol and lactic acid. Right. So like what Jeff's lab saw was like like if you looked at the glycerol content inside of, these athletes that were keto, it was really low after the race.

And there's a lot of thought that like these, this glycerol lactic acid complex, you're able to create like glucose or glycogen from this process as well to help fuel that glycogen like, triglycerides basically.

Right. The glycerol and the acids break down. Right? Right, right. So maybe it's just jumping into type of fats. Like what do you rec I mean, all fats really create equal.

And what are your thoughts about, you know, what type of fats you should be having? I mean, we sometimes hear about like Atkins diet, people eat whatever you want that like how much you ever, you know, meat or whatever, you know, the people and then. Right.

And then, so I think it I'm just wondering if you could just shed some clarity on that for us, for listeners. Yeah. I think it's about getting as high, high quality as, as you can.

Right. So I sell to people all the time, like people will say, oh, well, in that case, I'm just going to go to McDonald's and get a Big Mac without the bun.

And I'm like, well, like, is that okay to do occasionally if you're in a bind? Sure. I that's better than going to Krispy Kreme and getting donuts or whatever.

Like that's that's fine. But like should you be doing that every day for lunch? Probably not. So like what we know is, is saturated fats are often demonized.

And for all the wrong reasons. But I do think you should get a mixture of some of these other important fats, like mono unsaturated, polyunsaturated. But you need to be careful.

Primarily, what I see the most of is the omega six. Fats tend to run rampant like a lot of people will cook with vegetable oils and things like this. And so it throws at omega six to omega three ratio out of whack.

So just make small choices. Like if you're cooking with cooking spray don't get the canola oil. Get like an avocado oil spray or a coconut oil spray. If you're not cooking at a certain heat, like, just make some of these small changes.

Instead of getting like soybean oil ranch dressing, try making your own ranch dressing or there are sauces out there now that are using things like avocado oil as a base.

And so that's where I think when we're talking about some of these inflammatory fats where people just go, oh, I just, I can eat whatever. A lot of it's just like, keep it in context, make small adjustments to make sure that you're not like, blowing it out of the water.

I've had some patients come to me. They've started, you know, I think at least reduced carbon potentially keto keto diet.

Exercise, Muscle Gain, and Athletic Performance

And then they come back. The cholesterol has been elevated. So what what would you tell them? I mean, you know, I know cholesterol is on everything anymore, but what's what's your what's your thoughts on that?

Yeah, it's such an interesting, interesting topic. I think that what we typically look at in terms of total cholesterol and LDL cholesterol, we need to we need to adjust when we're on a ketogenic diet because I think again, it's also often got demonized.

Cholesterol is gotten demonized from total and LDL cholesterol. One of our colleagues, Doctor David Diamond, he does a really good job breaking this entire cholesterol conundrum down.

But the reality is, is you need to look deeper. You need to kind of take a magnifying glass and look at look a little bit deeper than just total cholesterol.

What I recommend to people when they're like, oh my gosh, my cholesterol is really high. I say, go get an NMR light bulb profile test. It's going to give you a deeper understanding of like particle size, and all these other factors.

But you also need to take into account other inflammatory markers like look at creatine kinase, look at hemoglobin A1, see look at fasting triglycerides, and then look at the NMR as well because you can't make a judgment.

And this is what's scary about traditional medicine is like they will do a basic cholesterol profile. Not look at any inflammatory markers, not look at A1 see not look at fasting triglycerides, see someone's cholesterol a little bit elevated and go, you need to be on a statin.

And then it's like we we know there's plenty of side effects that come along with certain. And it's like that person could have been amazingly healthy, like perfectly fine and healthy.

But like, the markers are the goalposts that we've set for cholesterol and it being the be all end all for health. We missed that mark. And I think it's about time we we update them and come to new terms of like it's not a it's not just as easy as let's look at cholesterol and LDL cholesterol as the only viewpoint.

Yeah. No thank you. That's that's so well said. So what maybe we just we're just kind of ending off a couple of things I want to ask first, is that on your own health, like, how would you say this has impacted you?

Like, I mean, you look like you're in great health. I'm just curious if you could just kind of tell people, like what impact it has had for you. Yeah, for me, I never and this is interesting because I never approach keto for weight loss.

I came into it from more of a researcher, like, I can't put our subjects through this if I haven't done it. And so I did it. And the first time I did it, I failed miserably because like I said, I didn't know what the what proper electrolyte balance was.

I was eating, I was just chugging heavy cream and like, trying to make everything into a sweet dish because I had such a sweet tooth and I was like, I messed it all up.

But it took me about six months to figure it out. And I was like, you know what? Let me give this another shot. Now I stay, I stay keto and I will probably be eating keto for the rest of my life in that, like I reap all the other benefits.

So for me, a lot of it's cognitive focus, like clarity, having what I call food freedom, that was a big thing for me because I was someone when I was younger and playing sports and all these other things, I could eat whatever I wanted right?

I could eat Chick-Fil-A, I could eat it didn't matter. I could eat it because I was I was playing baseball. I was burning through calories like crazy.

But the minute that stopped, I was like, oh gosh, my metabolism changed pretty significantly. And with that, I still have the same hunger that I had prior.

So I was used to eating 5 or 6 meals a day. Now I, like I just told you before, there's some days where I eat one meal a day. There are some days where I two meals a day.

If I was primarily reliant on a carbohydrate based metabolism, that would be almost impossible for me to do so. With the work that we do at our lab with the education.

Like it's so freeing to me to go. It's the afternoon and I haven't even eaten today like I that's that's unheard of before the calorie to remain the same, right.

The calories remain the same or. No. Yeah. And you just eat more calories at one time. Is that what happens exactly? I eat a larger portion like I typically I'm known for eating like a lot of com salads.

That's typically my lunch. I like volume because I still, even though my hunger is significantly less on keto, I still have like, you know, I need to eat volume to help increase my fullness and increase satiety.

So I like big salads. Sometimes I make shakes and I blend them up. So they're really big shakes, but they're they're not really calorically dense. They're they're just blend it up with ice and unsweetened almond milk and some protein and MCT.

So for me it's probably the same amount of calories, but it's just brought down to bigger volume, smaller eating window. Interesting. Very interesting.

Just, one other thing about you mentioned about the Alzheimer's. I know you have a, I know a lot of our viewers. Interesting. That ties directly to aging.

So, can you just talk a little bit about that, like the impact about ketogenic on on, you know, preventing Alzheimer's or dementia? That'll be for sure.

Yeah. What we see, and it's, it's being referred to as type three diabetes now. And what we're seeing is a lot of insulin resistance being the underlying root issue in a lot of these neurodegenerative diseases Alzheimer's, Parkinson's, traumatic brain injury, the list goes, goes on and on.

And what's happening like, for example, we're studying right now, traumatic brain injury, which correlates very similarly with Alzheimer's.

Fats, Cholesterol, and Lab Markers

Like if you take some of these professional athletes who have played contact sports and you compare their brain versus an Alzheimer's patient brain, most doctors wouldn't be able to tell the difference.

There's a lot of similarity with tau plaques and build up and a lot of issues. But what happens in these brains? It happens a little bit slower and prolonged.

And Alzheimer's, it happens very rapidly. And traumatic brain injury is in traumatic brain injury. When you get this huge impact, you get this hit to the head.

Your brain becomes temporarily insulin resistant. Yet what do athletes do? They go over to the sideline, they chug down sugar, right? They chug down a lot of these sugar based drinks.

Well, their brain is unable to utilize that. It's what we call starvation in the face of plenty. You have plenty of quote unquote fuel in your brain, is still starving and is starving for an energy source that you're not providing it, and that that energy source should be ketones.

Because the tunnel's going into the brain that take up and utilize ketones are still there. But the tunnels that take up and utilize glucose and carbohydrates, it's like there's a wall there, it's blocked off.

It's unable to take up and utilize that fuel source. And so there's been a lot of work done on both the Alzheimer's front and hopefully soon, with the traumatic brain injury front providing alternative sources of fuel for the brain, for Alzheimer's brain, and just for the aging brain in general.

Because as we get older and as we age, our ability for our brain to utilize carbohydrates and glucose as a fuel, it doesn't go up, it goes down. And so as we get older, we need to find ways to improve our insulin sensitivity and probably become a lot more carb conscious to be able to provide that fuel that our brain needs.

Wow. So what about the apolipoprotein E, ApoE? Gene, I do think that these people have even more problems with, taking up sugar, glucose into their into their brain.

I do with the ketone. Ketone? Diet help with that? I do. And there have been studies looking at this. There have been studies with Alzheimer's patients separating out ApoE4 and Noni.

But before, like there and they've done a ketogenic diet and seen a little bit more benefit in the individuals who have that gene even than people who don't.

And you typically see an earlier onset of Alzheimer's in those individuals where it's like they're starting to forget things at an earlier age. They're starting to have a little bit of, dizziness and confusion and forgetfulness just in general.

And you start to see that an earlier age, again, a lot of it is a lack of fuel. There is a lack of fuel that needs that you're unable to provide to the brain.

And then on top of that, you have these the it's either because of that or in conjunction with other things that are going on, you have these plaques and tangles that are building up in the brain.

I like to describe it like, imagine like a female's hair, like, and you just take it and you make it a bunch it all up in a ball, it becomes like a tangled mess.

They need to, like, comb it out in order for to get all those tangles out. Now imagine those tangles going on inside of your brain. You wouldn't want that.

You need to clean that, clean that process out. And there are things. There are studies with things like coconut oil, the lauric acid instead of coconut oil having beneficial effects for helping clear some of those tau plaques and some of those tau proteins, obviously.

What now? What is the what in coconut oil? The lauric which which, lauric acid C12 or C12. Yeah. Like what's that we have I think what about like or you know, I've seen this MCT has which is what are the components of that.

Yes. Some MCT medium chain triglycerides typically have a combination of C6, C8 and C10. Okay. C8 is what most people call the most ketogenic MC of, molecule, right?

It converts to ketones very rapidly. So you'll see a lot of MCTs that will highlight a high C8 because it's able to convert over to ketones very rapidly.

Like what about like I've seen it in, you know, Dave Ashby's Bulletproof Brain, octane oil. I think that's that's a C8, isn't it? Yep. That one's a C8.

But the thing that makes coconut oil unique and different from regular MCTs is the C12 lauric acid. So C12 is a he just only find. Where else do you find it? Apart from coconut oil? Anywhere else?

Coconut and coconut oil is is really the highest source of C. Wow. And so this this what's so special about this? Like how does this thing help with, with the Alzheimer's.

Like, how does this stuff. Yeah. So C12 has anti-microbial effects. So it basically what they think is going on and there's some study there's a study out of Japan, that doctor Mary Newport actually helped, run.

Personal Health Benefits and Brain Health

Yeah. Is that, C12 has this anti-microbial effect and it actually may go into the brain potentially clear out some of the debris or tangles that are going on.

But also what they found is there might actually be some keto genesis or like, like formation of ketones inside of neuron like neuronal cells inside of the brain.

So it might also be able to be providing a fuel source directly inside of the brain, which is really interesting. That's amazing. Okay. Maybe just if, doesn't like just for beginners, like somebody.

Now, first time they've heard you talk today, what should they take away from today's talk and what, you know, what's your advice to them? What's the main message?

If they're someone who's just starting out on keto? Don't like you have to be careful who you listen to. Don't over complicate it yet. Go in with some education.

It's something that if you don't, it's like building a house. If you don't have a good platform or a good foundation, when you build a house, whenever you start building higher, it's going to start crumbling down.

Same thing goes for any type when you're focusing on health, when you're focusing on anti-aging, all of these things, you need to have a proper foundation.

And I know the theme of this entire conference and some of this is anti-aging. And there's so many factors that play into anti-aging. Today, we discussed how nutrition is is can be an integral part of that.

And like I refer to it as a ketogenic lifestyle for people. And one of the things we educate is it's not just the food you put inside of your mouth. Like you need to focus on things like improving your sleep, getting sunlight.

We talked a little bit about exercise, figuring out ways to de-stress. These are all factors that contribute to either accelerated aging or anti-aging.

And I think ketosis can be an incredible tool. And part of all of those. Me that's so interesting. Do you think that, like, what should someone expect to go on this journey?

Because I'm it's, you know, some of sometimes similar transformative, you know, journeys like that, and they usually take some time, like I want, I think a, like, do people expect that this is a 1 or 2 year journey?

Like, what should they expect? And I you had failures yourself. Like, maybe we just talked about that for you. Just for the listeners. Yeah. Yeah. What I tell people this, I say before you even start, the number one thing you need to do is figure out your why.

Like, why are you trying to make a change? Because that will tell you how long you're going to be able to stick to it. And I usually the example, a good friend of ours, one of our clients, actually, Tony Robbins, does this exercise with people.

And so we've kind of replicated it for, for keto. It's like, listen to ask someone if you're if you're at home right now and you're watching this, like write down if I don't ask you what is your why for why you want to do keto and you write that down.

Most people will come up with something like, I want to lose 10 pounds, right? I want to lose 20 pounds, or whatever, whatever it may be. The reality is like, that's a surface level. Why?

Like that's going to get you to stick to keto for maybe 30 days, and then you're going to go, I hit my goal or whatever, you hit that, then you're done.

And so I like to go for layers deep, so, well, why do you want to lose 20 pounds? Like what? Like why does losing 20 pounds matter to you? And it's not because you want to get more likes on Instagram because you're going to post a picture in the bikini or whatever, like that's not your true.

Why you might be because you want to be less tired when you come home from work. And like I go deep into it and like eventually the ultimate reason might be you've been coming home tired, you haven't been present with your family, and you know that losing some of that body fat will help with that.

Your real why becomes that you want to be a better spouse and a better mother or father to your kids, and so that you know that losing this body fat and improving your metabolic health will allow you that when you're when you come home from work or whatever you're doing, like you can run around in the backyard with your kids, you can play with them without being super tired and being like, honey, I just need to go to bed.

That's a deeper why that when you look eight weeks, eight months, eight years later, that's always going to be something ingrained with you other than I just want to lose 10 pounds, right?

Getting Started and the Bigger Lifestyle Picture

Right. Yeah. No thank you. That's that's really helpful. Just on ending off on a philosophical note now, you know, everyone wants to be, like, back to nature, like, everybody wants to do the natural thing and all that.

And so how do you how do you how do you put that in your mind about the ketogenic diet? And, you know, the, you know, how much are we meant to be in, in ketogenic lifestyle?

You know, let's say paleo diets, you know, people are also looking at that as well. So I would love to hear your thoughts on that. Yeah. I think, I think a ketogenic diet as primal as, as you're going to get like we went through, we talked about the benefits of fasting.

Listen, we're living in a world right now where we have access to food that was never available prior, ever in the history of of humans. Think about Hunter gatherers like you used to have to hunt down an animal and chop it up yourself, cook it, eat it.

And then it was on to the next hunt. And then you might go a day or two days without eating, I promise. You are ancestors were in ketosis. They were absolutely in this state of ketosis.

And so I say that like as as you start to see keto continue to grow because it is continuing to grow. The premise of it and the core of keto is focusing on whole foods.

I think there will be keto products that come out on the market, like bars and cookies and things, and for some people, that can help them, right? If you're going from eating a really high sugar, cookie and like, there's this keto alternative and that helps you from falling off the wagon.

Great. But the premise, the core 80 to 90% of what makes up our diet should be focus on whole foods, and that can be easily done on a well formulated diet.

Wow. Okay. Thank you so much. This is so helpful. I really appreciate your time. Everyone, thank you so much for attending this talk with Doctor Ryan.

Laurie. So, talk to you next time. Awesome. Thank you.