How To Control Diabetes With A Plant-Based Diet Transcript

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Introduction and Guest Background

Hi everyone. Welcome to this episode of the Reversing Type 2 Diabetes Summit. I'm your host, Dr. Beverly Yates, ND. I am delighted and honored to interview Cyrus Khambatta, PhD.

He is a wonderful expert in the world of blood sugar management and diabetes and also a person who has Type one diabetes and has a very personal journey that comes with his expertise.

It's always amazing when someone both is having a lived experience as well has the expertise, right? So in this case, as we talk about mastering diabetes, using a low fat, plant based whole food diet, as we talk to Cyrus, one of the things we're going to cover are causes of insulin resistance and other issues around maximizing insulin sensitivity so that the insulin you have works optimally.

Well, because I think that a lot of times people don't understand the relationship and why that's going to matter. So Cyrus Khambatta, PhD, is a New York Times best selling coauthor of Mastering Diabetes, which is a wonderful book, and he has helped more than 10,000 people reversing the underlying causes of insulin resistance.

He has a Bachelor of Science in Mechanical Engineer degree from Stanford University, as well as a Ph. D. in nutritional biochemistry from the U. S. versity of California in Berkeley.

He's an expert in both Type one and Type 2 diabetes and has been living with Type one diabetes since 2002. This reduces insulin use by more than 40% using a food first approach.

All right, Cyrus, welcome to the summit. Thank you so much, Dr. Yates. It's really great to be here with you. I really appreciate you inviting me. Absolutely.

I think that we are going to have a really robust conversation soon because I think there's myths that need to be addressed and maybe some things where people haven't thought of in terms of opportunities for their own health management, in particular being able to make sure that the insulin that they have, that their bodies are more sensitive to and responsive to it, because that's a large part of the problem that goes on.

So let's start with a particularly juicy topic here. What is the problem with eating a low carb diet for people living with all forms of diabetes? Phenomenal question.

It's actually the you know, it's interesting because in the world of prediabetes, type 2 diabetes in particular, low carbohydrate diets are not only the norm, but they're they're talked about with like a lot of fervor and a lot of people are like excited to go into a low carbohydrate diet because the the rhetoric in the world of diabetes is that carbohydrates are bad for you.

Carbohydrates are going to cause a blood sugar spike and that's going to cause an insulin spike and then that's going to the glucose or the the sugar from the carbohydrates that you eat are going to then be converted into fat, and then that's going to make you fatter.

So people believe this. They start to hear this, you know, in many different ways, in many different forms. And they say, oh, okay, carbohydrates equals sugar.

Sugar is not good for me. Therefore, I should avoid carbs.

Why Low-Carb Diets Backfire Long Term

And then they they start the process of being on a low carbohydrate journey. Now, I would say there's kind of pros

and cons to being on a low carbohydrate journey.

When you eat a low carbohydrate diet, what most people find is that their blood glucose comes down pretty darn quickly. So they start eating a low carbohydrate diet, and that means that they're effectively eliminating or significantly reducing their intake of all carbohydrates, including refined carbohydrates like cookies, crackers, chips, pastas, breads, sodas, sugar sweetened beverages and beyond.

And then in addition to that, they're also limiting or eliminating foods like fruits, like bananas and mangoes and papayas. And then they're also trying to reduce or eliminate their intake of whole grains and potatoes.

And so they sort of like get rid of both the whole and the refined carbohydrate foods. And in substitution, they begin to eat more foods that come from the animal based world, in particular more red meat, more white meat, more chicken, more fish, more eggs, more dairy products.

And then in addition to that, the rhetoric is also, hey, include oils in your diet, especially coconut oil, because it's really good for you going to have some olive oil as well.

And then people start to add in things like nut butters as well, and then they add in avocados, nuts and seeds. And before you know it, now they're eating a diet that contains something like 60 to 70% fat and then about 20% protein.

And the remainder call it 10%, 20% in carbohydrates. So when people do this, what they find is that their blood glucose comes down pretty darn quickly.

They find that their blood pressure comes down quickly. They find that their cholesterol values, their triglyceride values. I should be very particular.

Their triglyceride values come down very quickly. They find that they lose weight very rapidly. And as a result of that, they're like, oh my God, look, I started doing this low carbohydrate thing in February.

It is now April and I've lost 42 pounds. My cholesterol has been reduced. My triglyceride has been reduced by 60 points. My blood pressure has fallen by 15 points and my blood glucose is now down by 55 points.

This is fantastic. I'm going to keep doing this. But what they don't realize is that all these short term benefits that they're getting within the first couple of months, maybe three months, maybe six months, maybe even as much as a year, they begin to reverse.

If you fast forward in time. So if we move forward two years into the future or five years into the future, what the evidence based research demonstrates is that people who eat a diet that contains more dietary fat, in particular dietary fat that comes from animal sources, that these people are at a higher risk for most chronic diseases.

And that means that they have eaten themselves into a very high degree of insulin resistance, which we can talk about in more detail in a little bit. But then in addition to that, they also have increased their LDL cholesterol significantly.

And that is a huge, huge risk factor for a future cardiac event. In addition to that, they also find that if they got these temporary reductions in their blood pressure and their blood glucose and their cholesterol level, that those improvements begin to reverse themselves and those biomarkers begin to increase into the future and they'll hit some type of weight loss plateau after losing 30, 40 or £50.

And then they'll either not be able to lose any more weight or that weight will start to come back on and it'll start to increase over the course of time.

So I always think that I would tell people a carbohydrate restricted diet is a very good short term solution. If you just want to make numbers look better on a piece of paper.

But it is a terrible long term solution because the evidence based literature demonstrates that the more animal foods you eat, in particular in the higher fat concentration you consume, the higher your risk for most chronic diseases.

And I don't want that and I know you don't want that. You're absolutely right. We don't want that. Right. Because underneath all of that, the glue, if you will, so to speak, their minds are together, that inflammation.

And there's sometimes inflammation, like when you get a finger cut, that's good because it lets you knit up and heal with other inflammation that will kill you and take you out of this life sooner rather than later.

So I think this is a great opportunity to go a little deeper on this topic because I know there's all kinds of myths and there's some confusion and it's understandable, right, because different people respond well to different approaches.

I wish there was a one size fits all, but I can honestly say there's some genomic variation right? So why is it that a low carb diet and you've pointed out really wonderfully well with clarity here, Sara, thank you for that, what the benefits might be for someone short term, but longer term, it's a problem, right?

So why does a low carb diet increase the risk for long term complications of diabetes? Any kind of diabetes? All right. It's a great question. And to answer that question, we're going to have to do a little bit of deep diving here into the biochemistry of insulin resistance.

So for the listeners out there, I want you to sort of close your eyes here for a second and just imagine what happens when you eat food. Okay. So first things first.

If you're eating a low carbohydrate diet, like I said earlier, you're trying to limit or eliminate foods that come from both the refined and whole carbohydrate world and you're increasing your intake of animal foods in particular.

Now, there are people for full clarity that choose to consume a plant based diet that is high in fat. It is a very small percentage of all people. So those are people who are eating things like avocados and nuts and seeds and nut butters and oils and using that as the bulk of their proportions.

But again, that's a very, very, very, very, very small percentage of the population. The majority of people who are eating a low carbohydrate diet are eating more animal products, period.

End of story. Okay. So those individuals end up eating a high amount of dietary fat and the fat is locked up is a molecule called triglyceride. So triglyceride effectively means you have a molecule called glycerol, which is represented by my hand right here.

And then you have three fatty acids that are that are attached to the glycerol molecule. So you have tri for three and glycerol for glycerol. So triglyceride means glycerol with three fatty acids.

Now that's the storage form of fat in nature, it's the storage form of fat inside mammals, especially humans. Now you eat triglycerides from food and those triglycerides go into your mouth, They travel down your self.

I guess they get inside of your stomach, inside of your stomach. They they are they meet the the acid bath, which is, you know, hydrochloric acid, which is secreted by the walls of your stomach.

And as a result of that, these are a lot of the components of your food begin to sort of get denatured and unfolded in a slightly linear rise from that point onwards that that partially digested food material goes into your small intestine.

Now, your small intestine is a magical, magical compartment because inside of your small intestine, that is where the bulk of all nutrient digestion and absorption happens.

So inside of your small intestine, you have enzymes. These are called digestive enzymes that that act on the food that's partially digested. And these digestive enzymes are secreted by your small intestine itself, your liver and your pancreas.

And these digestive enzymes are things they're called carbohydrates and proteases and light pieces.

How Dietary Fat Drives Insulin Resistance

And their responsibility is to is to act on the food that you are, that that is being partially digested or that is partially digested. And to try and break down large structures into smaller structures and then eventually smaller structures into individual units.

So the triglyceride molecule in particular ends up getting cut and the glycerol ends up floating away into oblivion and ends up actually participating in glucose metabolism.

But the three fatty acids end up getting absorbed through the walls of your small intestine. They get put into your lymph and then they eventually make their way into your blood.

Now, inside of your blood, you have these little spaceship containers, these little spaceships. There's trillions of them, and they're called Kylo Micron particles.

These kind of micron particles are fascinating little, little containers, because what ends up happening is that the fatty acids get put into the kaylon, micron color micron particles, and then these kind of microns circulate all throughout your cardiovascular system with one objective in mind.

And that one objective is to offload the fatty acids that they absorbed from your meal and then to also offload cholesterol that was absorbed at your meal.

So the kind of micron particles are trying to offload these fatty acids and you can think of the color micron, it's just a little transport vesicle. It's a little spaceship whose job is to sort of take these fatty acids and cholesterol from your digestive system elsewhere.

That's it. So the fatty acids end up getting offloaded into your adipose tissue or your fat tissue, which is exactly where it's supposed to go. That's a safe place to keep fatty acids, because that's the tissue that was perfectly enzymatic and mechanically designed to store these fatty acid molecules.

So the column micron particles start to offload the fatty acids into your adipose tissue, and that's a good thing. The adipose tissue takes them up. It says, Thank you very much.

I appreciate it. It takes the fatty acids. It then stores them back into a triglyceride and it holds on to them for some period of time. It could be days, it could be weeks, it could be months, it could be years.

Now, the kind of micron particles also end up delivering these fatty acids into your liver and into your muscle. And that's where the problem starts. Okay.

In an ideal world, what these kind of micron particles would do is they would deliver the majority. I'm talking like 90%, maybe 95% of all these fatty acids to your adipose tissue because it's a safe place to keep these fats.

And then it would deliver just a tiny, tiny, tiny amount into your liver and a small amount into your muscle. And that's okay because your liver and muscle are perfectly designed to be able to take up small amounts of these fatty acids and keep small amounts inside of them to be used as a fuel for later use.

But what ends up happening is when you're eating a high fat diet, aka a low carbohydrate diet, the amount of fat that you're consuming at any one given meal is pretty large.

It could be north of 30 grams, it could be 40 grams per meal. And when you do that, these kilo micron particles end up transporting so much lipid into your adipose tissue that there's a spillover effect.

And that spillover effect goes into your liver and goes into your muscle. And the liver and muscle have no choice but to end up taking up more fatty acids than they were biologically designed to do.

And as a result of that, there's effectively a traffic jam which has now been created. So your liver ends up absorbing a lot of fatty acids, your muscle ends up absorbing a lot of fatty acids and now your liver and muscle are in, like you had suggested earlier, an inflammatory state, because they're sitting here and they're like, wait a minute, hold on a second.

I was never designed to take up this much fatty acid. So. So why is this stuff happening? I can't really block it from coming inside of me, so now I have to deal with it.

So what they do is they initiate a self-defense mechanism and the self-defense mechanisms says, All right, if I want to try and block more of these fatty acids from coming inside of me, what options do I have?

So a simple thing for them to do would basically be to, you know, take the fatty acid transport proteins that are on the cell surface and just basically say, hey, I'm going to turn you off so that I can't get any more fatty acids, but it doesn't really work that way.

And those fatty acid transport proteins aren't really regulated that way. So what they do is they actually go even to the higher level. They go to like the king of all molecules, the king of all, you know, energy storage molecules.

And that's called insulin. And they basically say, hey, listen, insulin is a ridiculously powerful hormone. Anytime insulin makes its way to this tissue, as soon as insulin magically appears, then that means that I have no choice but to take up fatty acids and amino acids and glucose from the blood because it is the single most powerful anabolic hormone that exists inside of a human being.

So if I'm going to block any kind of energy from coming in me but especially fatty acids, then what I'm going to do is I'm just going to make myself nonresponse to insulin.

So what that means is that the insulin receptors that are on the outside of this cell surface, they basically go, Hey, insulin receptors, do me a favor, come back inside and they start to what's called in vegetate or reverse the actual the direction of these insulin receptors and make it so that these in some receptors are not as functional.

So what that means is that the very next time you go eat something that's carbohydrate rich, I mean, it could be a bowl of black beans, it could be some cherries, it could be a banana, it could be a bowl of quinoa.

It doesn't even have to be that much. But some amount of carbohydrate energy, the glucose from those carbohydrates tries to get inside of your liver and muscle and insulin comes and knocks on the door goes, Hey, by the way, there's some glucose in the blood.

You want to take it up. And both of those tissues, your liver muscles say, oh, remember, I'm playing this insulin resistance game. I am resisting you right now.

I am going to reject you and I'm going to not pay attention to your signal, because if I do, I can protect myself against glucose and I can also protect myself against amino acids and fatty acids.

And that's a good thing because I am trying to store less energy, I'm trying to take on less fuel. And so as a result of that, what people who are eating ketogenic diet experienced is that as long as they don't have any carbohydrate inside of their diet, you know, I'm talking like 30 grams of carbohydrate or less per day.

What they'll find is that their blood glucose is very controllable because the fatty acids get inside of the liver and get inside of the muscle. And there's an inflammatory process which is happening under the surface, but it's

undetected.

But then the minute they eat something that's carbohydrate rich, it could be literally one banana. All of a sudden their blood glucose skyrockets. So when I say skyrocket, I don't mean it goes from 85 to 110.

I mean, it goes from 85 to 185 or maybe 285. Okay. Within a very short period of time. And what they find is that they go, darn, I told you, carbohydrate too bad for me.

I had one banana and now my blood glucose is high. I guess bananas are bad for me. I had one potato and now my blood, because I guess potatoes are bad for me.

And so it fuels this idea that carbs are bad and then they eat less carbohydrate and they continue to eat more fat. And all along they're actually building up this insulin resistance process inside of their liver and muscle.

And the insulin resistance process gets worse and worse and worse over the course of time. But yet, if they take a look it up on a piece of paper, they say, Hey, look, my glucose nice and flat, okay?

And so they get tricked into believing that just because their glucose is flat, because they're avoiding eating carbohydrate, that everything is safe.

But in reality, what they don't realize is that under the surface there's a storm brewing and that storm manifests itself over the course of six months to 12 months to a year, and then they end up with a whole collection of symptoms that are caused by this insulin resistance process that I make any sense at all?

Yeah, I think so. I think in walking people through it, right, because this is part of the, I think, misinterpretation of the information that people have where and some of this is cultural to where we have this belief, like if something's working, doing more of it is what we should do when we might not understand that we becoming perhaps rigid and unable to really process things in a healthful way.

Because like you said, if somebody goes super low carb and then starts to eat another rich source of carbs like potatoes or bananas, they might have this amazing blood sugar rocket ride, right?

They get on the rollercoaster and they spiking, they crash, and then they come to the conclusion that they're for that. Higher carb food now was bad for them and they ignores all the other nutrients that it brings.

And the fact that that insulin sensitivity, if you will, it's almost like that process didn't get invoked. It didn't get a chance to work out. You know, I think of things like my grandparents would say around use it or lose it.

And it's interesting, right? Yeah, absolutely. No question at all. Okay. So typical point of view that people have in the world of nutrition, certainly a mainstream thought when it comes to things like fruit.

Right? Is that fruit in general across the board is thought to be high in sugar. Whether or not that's true, in fact this is the thought and that when you eat fruit, it will always cause a blood sugar spike no matter who you are.

Right. So is that true or is that false? No, that is absolutely false. So, again, if you're eating a high carbohydrate I'm sorry, if you're eating a high fat diet or a low carbohydrate diet, then just like we talked about, you're eating yourself into an insulin resistance state.

And when you are in an insulin resistant state, then any form of carbohydrate, it doesn't matter if it's whole carbohydrate that comes from fruits and vegetables and whole grains and legumes, or if it's refined carbohydrate that comes from cookies and crackers and chips and pastas and brownies and breads and sodas.

It doesn't matter. Any form of carbohydrate energy is going to cause your blood glucose to go up. And the reason for that, again, is because your liver and muscle, that is where insulin resistance lives.

Your liver and muscle have are playing a self-defense mechanism to block excess fat from coming into those tissues. So when you're operating in a high fat environment, then, yes, carbohydrate metabolism just flat out doesn't work very well.

But if you switch over and you do the exact opposite and you begin to eat a low fat diet, that is a higher carbohydrate diet, what you will find is that the exact opposite happens.

Now, the stress on your liver and the stress on your muscles has decreased significantly. And as a result of that, the insulin resistance process no longer exists in fact, the lower your fat intake, the more insulin sensitive your liver and muscle become, because the higher your fat intake, the lower insulin action is in both of those tissues.

So you decrease your fat intake, you increase insulin action inside of your liver, you die, you increase insulin action inside of your muscle. And as a result of that, now when you begin to eat carbohydrate, any form of carbohydrate, your blood glucose behaves very nicely because those the cells inside of both of those tissues are able to recognize glucose and recognize insulin and play the carbohydrate metabolism game.

Okay. So your your original question is, well, does that mean that fruit equals sugar? And the answer is absolutely not, because you you can think of basically carbohydrates as being broken down into two different categories.

Like we talked about. You get the whole carbohydrate and then you've got the refined carbohydrates. The whole carbohydrates come from the natural world.

They're either minimally processed or completely unprocessed fruits, vegetables, legumes, whole grains.

Fruit, Whole Foods, and Blood Sugar

Those are the four categories of whole unrefined carbohydrates. Then you have the refined carbohydrates, once again, the cookies, crackers, chips, pastas, sodas, breads, sugar sweetened beverages and beyond.

Those are the types of carbohydrates that when people say, I'm eating a low carb diet, what they actually should be saying is I'm eating a low, refined carbohydrate diet, because that's the stuff that we know the research has very conclusively demonstrated is associated with increased chronic disease risk. Period. End of story. Okay.

So long story short, if you were to eat a let's take a perfect example of a banana. A banana is a beautiful, beautiful food for a thousand different reasons.

But when you're consuming a banana, most people think of it as basically just a pile of sugar and they associate it in their head like, okay, banana equals sugar sure doesn't cause us to go up.

That's bad. Is going to cause insulin to go up and make me fatter. I'm going to hold on that. Yeah, that's not a good thing. I'm not going to eat that. Right.

But what they don't realize is that the very first association they make was that banana equals sugar. That's a logic flaw and it's not their fault. They just haven't been taught the right thing.

Okay, A banana is a perfect example of a food that contains carbohydrate plus fat plus protein. Now, most people would be like, Oh, come on, Cyrus, Are you kidding me?

A banana contains protein. The answer is yes. All whole foods contain protein. All whole foods contain fat. All whole foods contain carbohydrate. It's just that it's mainly carbohydrate with a small amount of protein and a small amount of fat.

So those are three macronutrients which are present inside of that food. In addition to that, there are six classes of micronutrients which come along for the ride vitamins, minerals, fiber, water, antioxidants and phytochemicals.

Okay. Again, vitamins, minerals, fiber, water, antioxidants and phytochemicals. All of these behind the scenes players play a pivotal, pivotal role in directing the nutrient transport game inside of your small intestine in allowing glucose to get inside of tissues and allowing amino acids and fatty acids to get presented.

The tissues, the fiber in particular inside of these whole foods slows down the digestive process, which slows down the carbohydrate absorption process, which slows down the resultant blood glucose rise.

And that's a good thing. The fiber then cannot be digested by you because you do not you do not produce the right enzymatic machinery. So the fiber then travels into your large intestine and it gets broken down by 40 trillion bacteria that are inside of your large intestine called your microbiome, and the fiber becomes food for them and then they end up secreting these things called short chain fatty acids, which then go on to help tissues all across your body.

So a way to think about it is that Whole foods contain nine classes of absolutely essential nutrients carbohydrate, fat, protein, vitamins, minerals, fiber, water, antioxidants and phytochemicals.

If instead you decided that you wanted to eat a spoonful of table sugar, which I'm not recommending and I know nobody else is, but just for the sake of example, if you ate a tablespoon of white sugar, okay, what you end up, you get the question you got to ask yourself as well, what's inside of that? Okay.

Is there carbohydrate energy? The answer is yes, there absolutely is. Is there fat? Zero protein, zero vitamins, zero minerals, zero fiber, zero water, zero antioxidants, zero phytochemicals is zero.

The only thing that that tablespoon of white sugar had was carbohydrate. It had one out of nine classes of nutrients. So what does that mean when that when that table sugar goes into your mouth and it gets into their small intestine, the glucose is going to get absorbed incredibly quickly.

I'm talking within minutes inside of your bloodstream and that's going to cause your blood glucose value to rise because there's none of those other protective macro micronutrients that are coming along for the ride to help limit the rate at which that glucose rise occurs.

And there's no other supporting cast members to help the nutrient transport and the nutrient digestive process to unfold properly. So that's why when I when people tell me that a potato is equal to sugar or a that is equal to sugar or a papaya is equal to sugar, I say fundamentally that cannot be a true statement from a biological perspective.

There is absolutely no truth to that argument, but only until you deconstruct it to its component parts are you going to be able to understand that the two species of foods are completely separate from one another and literally cannot be talked about in the same sentence?

This makes sense. You know, people talk about nutrient density or avoiding refined foods, ultra processed foods, but never really understanding that it's more than it's just really refined or that it's highly processed is the fact that it has no hope, as you have so clearly said, of giving people any of the full robust complement of nutrients.

And that's actually a key part of the problem. That's the key. Okay, you nailed it. So how would someone know, how would they recognize in themselves that they are insulin resistant?

Because I found that a lot of people who have already been diagnosed with type 2 diabetes or for that matter pre-diabetes, often look at you like Bambi in headlights with blank eyes.

If you say insulin resistant, they really don't grasp what that means. Therefore, it's just as hard to understand what it means to be insulin sensitive in.

Correct? Correct. Correct. It's a great question. So I wish that there was a test that you could just go get from, you know, the grocery store or from CVS Pharmacy.

That was your insulin resistance test. And you basically you could just, you know, take it into the comfort of your own home. You drop a fingerstick of blood onto it, and then all of a sudden it would just tell you what your insulin resistance score is right off the bat.

That test does not exist. However, there is a test that you can take at your local, you know, quest or, you know, lab testing facility. And the name of that test is called an oral glucose tolerance test.

And, oh, G. T. sometimes is referred to as just a glucose tolerance. So the way that that test functions is effectively they're going to give you a solution of water and it's going to have 75 grams of effectively table sugar dissolved right into it.

And so you drink this, this sugar water beverage and then if it's conducted properly, what will happen is that the phlebotomist will check your blood and they will basically sample your blood for glucose and insulin at time equals zero just before you drink that solution.

And then they will measure again at 30 minutes and at 60 minutes and at 90 minutes and at 120 minutes. And the purpose of this test is to try and determine something very, very simple, which is when you drink that solution of sugar water, what happens to your glucose value over the course of the next 2 hours and what happens to your insulin value over the course of the next 2 hours?

And if you do this test properly, what you'll be able to do is construct two separate curves, which are these time based curves that basically shows what is the rise in glucose look like and what is the rise.

Actually, I was the rise and fall in glucose look like. And what is the rise and fall in insulin look like?

Testing for Insulin Resistance

And when you have that information in front of you, you can then use that to determine how insulin resistant you are. Okay. So imagine you took that test and you had the results in front of you.

Ultimately, what you're looking for are two things to determine that you are truly insulin sensitive. Number one, you want the rise in your blood glucose value to be relatively small.

Call it 30, 40 points maximum. So let's say you started the test at about 100 milligrams per deciliter. Maybe that value would go up to about 130 or maybe 140 and then would come right back down and it would baseline out by by at about 100 within that two hour window.

That would be a good response. And then you're also looking for your insulin value to also have a very small rise and then to come right back down to baseline values.

So let's say you started it at five, maybe you would come up to about an 11 and then it would come right back down to five and it would stay there and that would be a very good insulin response.

If you have a good glucose response or a small glucose response and a small and slow response, that means that your glucose metabolism, a.k.a your blood vessels and your liver and your muscle were fully equipped to be able to handle this sugar water solution, even though it's not a physiologically relevant beverage, even though it's not something that you would probably drink by yourself.

But the challenge of of metabolizing that sugar water was properly handled by your liver and muscle. If your blood glucose rise was significant, was was quite high or your insulin rise was quite high, either one of those two would indicate that something is wrong, that there's either too much insulin being secreted in order to keep your blood glucose under control or there's not enough insulin being secreted and your blood glucose went high as a result.

So there's a many ways that you can interpret it. But ultimately what you're looking for is a small rising glucose and a small rise in insulin. And if you can see that, then you're in a good place.

So for those of you who are listening, you can go to your doctor and you can say, Hey, I'd like to go get a glucose tolerance test, could you please sign me up for that?

And most physicians would say, okay, great, let's go do that. And when they do that, then hopefully you can get the response or you can get the answer to the question of whether you're insulin resistant or not.

Super. Thanks for walking us through that really clearly, the oral glucose tolerance test is often recommended or prescribed for women who are pregnant, and I've often thought that while that's one way to look at the possibility of gestational diabetes, that this is a test that should be more broadly applied rather than that very specific time window for half the population.

I could not agree with you more. You are literally singing my exact words. I think it's a phenomenal test because it's it's a direct measurement, literally a 100% direct measurement of how your bill, your liver and muscle are absorbing glucose.

And this is this is required in order for you to really understand whether you're in a good metabolic situation or you're in a problematic metabolic situation.

Yeah, yeah. Back in the day in naturopathic medical school, we would send people for an oral glucose tolerance test and instead of having them drink that sugar water, as you've explained, because that's a measured amount, I think that the beverage things called glucose or something, something you would never drink in real life, right?

We would send people for pancake breakfast and have their blood otherwise drawn at the 36 to 1920 minute marks just to prove the point that your actual foods are doing this to you.

For people who you know, you have to just make it really clear to them that they've got to make these nutritional changes so. Cool a. Yeah. So now just to go back to a point that you made earlier, you're talking about really low carb regimens, keto diet, things like that.

Why is it that you would not recommend the Keto diet in particular, and what problems affect those who are eating the keto diet? Okay, great. So the reason for that is very simple is because just like we talked about, eating a ketogenic diet is a short term benefit.

Okay? Eating a ketogenic diet is a short term Band-Aid. That that can make a number of biomarkers that improve in a very short period of time, but was actually primarily so originally a ketogenic diet was actually prescribed for young children who had a condition called intractable epilepsy.

And intractable epilepsy is basically a form of epilepsy that's very challenging to to control. And so researchers tried feeding kids a carbohydrate restricted diet under the hypothesis that it was carbohydrates that were actually causing frequent seizures.

And what they found out was that when they restricted the kids kids carbohydrate intake, that in fact, yeah, their seizure frequency went down significantly and they ended up with much better brain function.

And that was a significant improvement to their overall quality of life. Fantastic. That's a that's a phenomenal research study. But what they did find over the course of time was that these kids actually could not stick with the ketogenic diet because it became very challenging for them to do so.

And they ended up with a whole host of of side effects as a result, one of the most prominent side effects was a significantly elevated LDL concentration, which is very dangerous because that can increase your risk for a future cardiac event.

Okay, So if I had to list in my head the reasons why I don't like recommending ketogenic diet and why I pretty much never do do that is because number one, I'm a fan of nutritional strategies that have both short term and long term promise.

A ketogenic diet does not have long term promise. That is a fundamental flaw of the approach first and foremost. Okay, the world in which we live is all about instant gratification.

When you're on the Internet, everything is about instant gratification. I want this show on Netflix right now. I want this thing to arrive at my door from Amazon in the next 6 hours.

I want to order food from that restaurant and I want it to come to my house in the next 30 minutes. Okay. I want to go on to social media and I want to see pictures of my friends immediately.

I want to be able to go to Spotify and I want to be able to listen to the very song that I care about right now. Okay? Everything in this world is constructed for us to be able to to get what we want immediately.

And there's benefits to that. But there's also side effects to that. When it comes to health, you can't expect that you're going to improve your health instantaneously or that you're going to improve your health in the next 15 to 30 days.

And whatever you do in this time window is going to be your solution for the rest of life.

Why Keto Is Not a Long-Term Solution

The truth is that establishing good health takes time. And if you're going to develop a regimen that's going to put you in a good metabolic situation into the future, I'm talking five to 10 to 15, 20 years from now, you have to focus on making small habits every single day of your life.

And if you can focus on making those small habits and you can drill those habits into your into your being so that it becomes something that you enjoy doing and something that you are going to stick with in the long term.

It will likely pay off and make you a significantly healthier individual. Okay. A ketogenic diet is all about short term instant gratification. No matter how you look at it.

The marketing is all about rapid weight loss, rapid blood glucose reduction, rapid blood pressure loss, rapid triglyceride decrease. That's what everybody wants is rapid results.

And so it is a fundamental flaw because, number one, yes, it does provide rapid results. But number two, it is a horrible, terrible long term solution.

Okay. Number three, when you eat a ketogenic diet, it makes you just like I said earlier, so insulin resistant that it can significantly increase your risk for many, many, many chronic metabolic diseases.

Okay. Now, in the book Mastering Diabetes, we wrote about the fact that insulin resistance, in my professional opinion, is the single most important health condition of our time.

There is no other health condition that I believe is as influential in promoting chronic diseases as insulin resistance. And the reason I say that is because if you look in the literature and you try and figure out what do all of these diseases have in common, all forms of diabetes, type one, 1.5, prediabetes, gestational diabetes and and I'm like type 2 diabetes.

Thank you. Right. Then in addition to that, you have all these cardiovascular diseases. You got you got high cholesterol, you got hypertension, you got artery disease, you got atherosclerosis, then there's many forms of cancer, then there's fatty liver disease, there's chronic kidney disease, there's type three diabetes, which is considered dementia.

Then you have erectile dysfunction, you have blindness, neuropathy and retinopathy. Every single one of these conditions is negatively influenced by high blood glucose and negatively influenced by an increasing severity of insulin resistance.

So what that means is that if you just focus your attention and energy on reducing the amount of insulin resistance present inside of your liver and muscle, that will have a ripple effect on so many other disease states and you can significantly reduce your risk for every single one of those diseases that I just mentioned.

And that's going to be a very powerful solution for you in the short and in the long term. So the only way to get there from what I've you know, I've read thousands of papers and I've been in this world for more two more 20 years.

And I and I have found one very, very, very powerful approach, in fact, so powerful that it's almost mind boggling and that that approach is to eat a plant based diet that is very high in micronutrients, that is very high in fiber, that is actually, truth be told, quite high in carbohydrate, but simultaneously very low in fat and particularly saturated fat.

If you are to eat that type of a diet, then what the research demonstrates and what all of the work that we've done demonstrates is that that is probably the single most powerful insulin resistance reversal tool ever discovered.

And if you can focus on that, your entire life can change within a very short period of time. That's great news. I think that, you know, it's so interesting when there's things in the mainstream media and other places for yet another nutritional discovery.

It's always interesting to me how oppositional so many of them are. They go from one extreme to another. Like I remember when I practiced in Hawaii for a while, a study came out that it was bad for kids to eat carbs kind, including healthy, you know, nutritious.

Li robust carbs. And I remember talking to some parents at the time and they were like, who do we listen to? Because they never seem to agree when it comes to the experts.

And I'm like, you know, you got to look at your own health and how you're responding, right? Because the end of the day, you got to live with whatever the choices are you're making around lifestyle.

And if you're in charge of a household or feeding others, it has that kind of impact, right? So I'm thinking about people listening to our exchange. I'm really loving this interview, you know?

Thank you for your time and expertise here. And one question comes to mind is how does someone get started? Let's say they're resonating with your message.

They're thinking about this. They're like, okay, I really willing commit, let's say, to a low fat diet or a plant based diet. But my blood sugar, let's say they already have type 2 diabetes or pre-diabetes, right?

Maybe they're doing finger steaks or they're wearing continuous glucose monitor or something, though they've got some objective data that says that their blood sugar spikes or maybe they can feel it when they eat high carb foods like fruit.

So how do they get started with this if they're going to go on this journey? Okay, that's a great question. The way to get started on this is to do is to make sure that you pay attention to the order of operations.

So what I mean by that is the ultimate goal is for you to increase your intake of carbohydrates and to decrease your intake of fat and protein. And when you do it that way and you're eating predominantly plant material, that's going to have a significant, profound positive impact on your overall health like we've just talked about.

But if you to get from here, wherever you are here, call it the standard American diet or a low carbohydrate diet or a ketogenic diet, too there. And you made the switch overnight. Well, guess what?

Your glucose is going to go sky high and you're going to look at it. You can be like, oh, that guy that I heard from on the Internet, that guy just nobody's talking about it doesn't make any sense. Right.

So we got to think about it in a way that's going to set you up for success. The most powerful way that you can do it to get started is to, number one, subtract fat, rich foods first.

Number one, subtract fat rich foods first, and keep those foods at a very low amount for approximately seven days. Then once you have subtracted those fat rich foods, you can then begin to increase your intake of carbohydrate rich foods.

But you have to give yourself a little bit of a buffer, a little bit of some period of time to help your liver and muscle get rid of the stored excess accumulated fatty acids that they've accumulated over the course of time and begin to oxidize those those lipid particles so that they can wake up their glucose metabolism, you know, the machinery once again. Okay.

So that seven day window is usually plenty of time to be able to allow that process to unfold. So if you're looking at your diet, what I want you to do is take a look and say, okay, cool, where are the fat rich sources?

Does it come from peanut butter? Is it from turkey burgers? Is it from hot dogs? Is it from Oreo cookies? Is it from olive oil? Right. Or is it from, you know, red meat, white meat, eggs, chicken, fish, dairy products, ice cream, you name it.

It could come from any of those or it could come from a lot of those places. I want you to first identify where are the high fat foods. And I want you to make a significant reduction to those that your intake of those foods In the first seven days when you have done that, then you can start to increase your intake of carbohydrates foods.

But I do not want you eating refined carbohydrates like we talked about earlier. I want you to be eating whole carbohydrates again. Fruits, vegetables, legumes and whole grains start to increase intake of those foods somewhere around the seven day marker.

And just watch what happens to your blood glucose. You might predict that your blood glucose will do weird things. You eat a banana and all of a sudden you might predict the glucose.

I head up to 150 or 180 or 200, and then when you actually do eat that banana, your blood glucose goes to 114. Okay, Next time you eat a bowl of black beans, or maybe you have some chickpeas coming with some quinoa, you eat that bowl, you might be like, Oh my God, it's going to go up to 165.

How to Transition to a Plant-Based Diet

And then you eat that bowl and before you know it, your glucose is at 132. Okay? And that's because you subtract it first and then you add it. So if you were to do that process and you were to stay very present with that process and keep your total fat intake to between ten and 15% of all calories, or another way to think about it is less than 30 grams of fat per day.

That right there is your number one ticket to success. It will work and it will work like wildfire. That's a great insider pro tip. Thanks for walking us through it.

And so just to really bring that point home, you did such a great job, but I know how people are. What are your thoughts about people who say, but wait, Cyrus, I want to eat organic gluten free, right?

Dairy free corn dogs. What are your thoughts? Ha ha ha ha. Very, very good question. Okay, so effectively, what you're saying is that people are going to people might be looking for processed foods that appear to be healthier, right?

Yeah. Or let's call them let's call them vegan junk food. That's the way that I like to think. Absolutely. Yeah. You know, it's gluten free. It's dairy free.

It has all the right buzzwords on the on the container, but yet when you actually look at the ingredients, it's a bunch

of nonsense and it doesn't make any sense.

So one of the things one of the games I like to play with people is to take a look at the ingredients on a package. And I like to tell people, I want you to draw every single one of those ingredients, go for it, bring out a piece of paper and draw them for me.

Okay? And people look at that. Be maltodextrin. I don't know what that I don't know how to draw that right. You know, carrageenan. What the heck is. I don't know what that looks like. Right.

So if you can't draw it, if you can't recognize it, and if you certainly can't pronounce it, then chances are you probably don't want to be putting that into your body.

And trust me, those vegan, you know, gluten free, dairy free corn dogs, I guarantee you cannot pronounce probably 30 of the 35 ingredients that are inside of that thing.

Okay. So don't be fooled into thinking that just because something has a bunch of really snazzy marketing on the front end, that it's actually genuinely healthy for you.

Instead, go spend your time in the produce section. Go spend your time in the bulk section, go pick up some wild rice, go pick up some quinoa, go get some oats and some barley, go get some fruits, go to the potato section, Get any color of potato you want.

Purple, green, brown, red. I don't care. Eat those foods. Go to the squash section. Go get that. Go get some corn. Right. Then when you're really focusing on those types of foods, you're going to notice that you're probably going to feel a lot better.

You're gonna have a lot more energy and you know, it's going to it's going to significantly improve your your overall metabolic health. The last thing I'll say to you is that resist the temptation to make these changes quickly.

I know, again, like we're saying in today's world, it's all about instant gratification, right? You want to fit into that bikini and you want to do it in the next 35 days and you're looking to lose £30.

Well, trust me, even if you are successful doing that, you're probably going to gain that weight right back as it is. As soon as that, you know, the summer is over.

Okay. Instead, create a timeline in your head that is a minimum, a minimum of six months and tell yourself I'm going to make dietary changes and I'm going to make them slowly.

And the reason I'm going to make them slowly is because that eliminates the the significant, you know, like significant changes in your medication use.

Okay. And that can help limit the pressure that you put on yourself to have to make all these dietary changes and make it work. Because if it doesn't, a lot of the times people feel like failures and then they say, screw it.

I tried eating a plant based diet and it didn't work right. Then you ask them, Well, well, what changes did you make? Well, I tried doing this and I tried doing this and I committed for 20 days and I couldn't make it work.

So this is done. And then they walk away, right? You can't commit for 20 days. I want you to commit for literally six months and make microscopic changes and start compounding those changes upon one another.

And before you know it, three months, six months down the line, you're a completely fundamentally different who would be. Totally makes sense. I love the messaging around.

It's not going to be solved in a day. Too often people have the idea that, you know, like you said, this instant gratification that if I do snap my fingers, all of the problems that have been building up for the last 20, 30, 40, 50

years will be gone in a day, That's unrealistic.

No, not at all. It is. Absolutely. It is a figment of your imagination. Absolutely. Yeah. Okay, cool. So before we wrap this wonderful episode, I'd like to get your thoughts about this.

And I also want to call out the fact that some people have a familial relationship to diabetes. They may have diabetes of all forms or or one in particular that runs in their family, so to speak.

A genetic predisposition. Right. So for your message around a plant based diet being so central, does this also apply first, does it apply to non-diabetic people?

And how about folks who don't have diabetes themselves, but whose parents and grandparents had it at whatever age? Can they benefit from this message?

Yeah, absolutely. It's a great question. So the answer is yes. Even if you're non-diabetic everything that I just described happens inside of your body as well.

And the reason we know that is because there's plenty of evidence based research that demonstrates that all of the the processes that I just described happen inside of people who are either at risk for diabetes or people that have no glucose metabolism problems to begin with at all If you're human, then all of what I described is applicable to you.

Number two, if you are if your family members have some form of diabetes and you feel like you're at a genetic increased genetic risk for diabetes, I can tell you that even if that were the case, like even if you got dealt the worst and of all bad hands, which is that your mother and your father had type 2 diabetes and both of your mother's parents and both of your father's parents had died.

Type 2 diabetes, let's just say there's one, two, three, four, five, six people in the next two generations above you that all had diabetes and you're sitting there being like, Oh my God, It's just a question of when, right?

Even if you're in that situation, if you make the changes that we just described, you can eliminate, literally eliminate the opportunity of becoming type 2.

You can eliminate the risk of becoming type 2. And the reason is because the genetic component of diabetes is a is a real thing. You can inherit genetic susceptibility to increased risk for diabetes.

That is a true statement. But the lifestyle component of that, which is totally under your control, is far more powerful than the genetic susceptibility which you might inherit.

Okay, So if we had to, you know, put this on a scale of 0 to 100, I would say your genetic inheritance is probably worth maybe like five out of 100 points and your lifestyle is responsible for the other 95 out of 100 points.

Okay.

Genetics, Prevention, and Final Takeaways

So do everything in your power to control your lifestyle, your intake of total fat to less than 30 grams of fat per day. Limit your intake of saturated fat to less than ten grams of saturated fat per day.

Exercise on a regular basis at least minutes per day, six days per week. Eat a heavily, heavily plant focused diet. And we didn't even get into it. But if you do some form of intermittent fasting, that can also significantly reduce your risk for, you know, blood glucose disturbances.

The combination of all of that makes your life so much easier and it can really, really make a significant impact to your overall life. So fantastic. Thank you for that clarity and all of those points, wonderful tips and insights and

uncovering.

What are the details and where are the traps, the pitfalls and the misunderstandings along the way? I am sure anyone listening to this episode will be greatly helped.

We really appreciate your time, your expertise here, Cyrus. Thank you, friends. As you listen to Cyrus and other experts, would you be so kind and make sure that you share this summit while it is up and available freely with everyone you know who either has this issue or who cares about it, or who in general cares about their own health and is looking to have a robust, high energy, fulfilling, long old age and would like to avoid one of the number one reasons why people don't get that outcome.

We can all make a difference, you know, as we go forward here, I have this goal of positively impacting the lives of 3 million plus people with this information because I feel that human health has absolutely got to improve and we have got to work on the fundamentals of people understand what leads to health and what destroys it.

Thank you for your time and attention.