



## Episode 31 with Mike Mutzel

**Danny:** We are here at episode 31, I believe, and I am super excited today to be joined by Mike Mutzel, an amazing guy. He has got a wealth of information, but even more than that, the way he breaks some of that stuff is really top quality. So I am super excited to have him on. Before I get him on the line, I am just gonna give you a bit of a background for those who haven't come across his stuff. So Mike has a B.S. in Biology from Western Washington University and is currently completing his Masters in clinical nutrition from the University of Bridgeport. He is also a graduate of the Institute for Functional Medicine's, Applying Functional Medicine in Clinical Practice. And he is an independent consultant for one of the world's leading professional nutrition companies. He has worked as a nutritionist with Gerard Guillory in Denver, Colorado. And he has lectured alongside large patient-groups in the Denver area where they've also been featured on local T.V. programs discussing the power of nutrition and functional medicine. And in April of this year, Mike launched his first book, the Belly Fat Effect: The Real Secret About How Your Diet, Intestinal Health, and Gut Bacteria Help You Burn Fat. And much of what Mike talked about in that book, we are gonna try and dive into to give you some of the most pertinent points from that and then again there's just so much in it; definitely a recommended resource which I will link to you in the show notes. But without further to do, I'd like to say welcome to the show Mike!

**Mike:** Danny, thank you so much for inviting me! I am very happy to be here.

**Danny:** Awesome! And I want to dive straight into things because within the time frame, there is just so much I actually wanted to ask you. From looking at your stuff, I have watched your webinars in the past. Obviously, read the book and there are just so many questions we could ask. So, I'll try to keep it as narrow as possible.

**Mike:** Sure!

**Danny:** But before we get into the actual topic to discuss in the book and much of your stuff online, I think it'd be great if we could frame this for people who may be haven't come across you before. So, maybe we could dive a bit into your personal journey to this point. I'm kind of particularly fascinated to hear what people think are the maybe two or three events or experiences that they have really found to be a profound difference on the direction that their life has got to the point where they are now at. And concerning what you've done, it'd be great to hear a bit about your journey to this point.

**Mike:** Absolutely. I think that is a great starting place and a great question. You know, it's funny how these life experiences end up, you know, cultivating our path and shaping our future. So, basically, I think a major life experience that help me to get where I am today would be working with, as you mentioned in the introduction, Gerard Guillory, who is an integrative medical doctor in Colorado. A good friend of mine to this day and he kind of took me under his wing, you know. I have come from a fitness background and did the Biology undergrad. Really wanted to go to medical school and I had no idea what medical school was really like and what medicine was really like. But, I just fell in love with the subject in an instant and had always been interested in fitness and nutrition. So, it seemed like the right path. Long story short, you know, I took the MCAT, which in the States is the medical school aptitude test and I was so fired up that, you know. I was working for this nutrition company and that's where I met Dr Guillory. And I was doing consulting work and I told him that, you know, he knew that I was fit and at that time and I was doing league bike racing. So, he is like, "how about you work with my clients here or patients that have obesity, metabolic syndrome, **chronic diseases** and all that. And help them get their nutrition right. And that will help you to, you know, have a better opportunity to get into medical school and we will call it an internship." And I am like, "that's awesome!". You know, "so, let's do it!". Working with these really metabolically challenged, sick people, obesity, type 3 Diabetes, heart disease, you name it. And what I found was these people had a lot of inflammation going on and they didn't eat as bad as I would have suspected them to eat. And so, I realized that there was much more to the story than just calories and calories out that you hear about and read about. So, you know, I love research and science and I lived close to the medical school library there and would go to University of Colorado Medical School Library and start diving into metabolic research and I had this idea of writing a book and this was back in 2007. And long story short, I came across a research on bariatric surgery and then gut bacteria, gut hormones. And then it turned into this huge project that took me a long time to write. That was, I think, life changing event; number one was that really great opportunity and I actually decided that I didn't wanna go to medical

school. I started pursuing my Masters degree and I had a great job going and kind of partners with these guys that were distributing natural products on the West Coast. Things were rocking and rolling and then one day they fired me! Last year my sales were up and I mean everything was good and it was like out of the blue. And it really took me by surprise, but it turned out to be a huge blessing. Even though it was a short term financial loss, it caused me to finish the book because, actually this book was written really two years ago. Because I was comfortable with my work and everything was good. It was just sad that I had no real drive to complete it and finish it and make a cover and all that. Anyway, I think those two experiences would be the biggest that I could think of, that really helped me to push me in the direction that I am now.

**Danny:** Awesome! It's so great to hear that you can kind of cultivate these both of positive and at first what seems a negative experience though. That was great to hear two kinds of different experiences that shaped this whole thing. And when you mentioned the book, fantastic book, by the way, so, congratulations on putting something so amazing together. But, obviously in the book you go deep into the gut microbiology. Just how important is and the whole area of gut bacteria and the composition of our microbiome has kind of exploded recently. People are really now realizing just how important that is. We've got new exciting research coming out all the time. And I also had Dr Michael Ruscio on the show in episode 22 I think, talking about gut bacteria, dysbiosis, and we talked about hygiene, antibiotics and smaller factors that affect microbiome. We kind of looked at lot of the health aspects and one that was interesting for some people, I think some of them might have overlooked it because as we often see in the health and fitness industry, fat loss seems to be the big thing for people. But as you kind of point out that, really the gut bacteria has so much to do in affecting fat loss efforts. And it really can hamper someone's ability to lose fat no matter what they are doing to their calories. So, we are gonna dive a lot of that, into the details of that in the show. But maybe could you give us some cliff notes to start us off on just why the gut microbiome needs to be taken into account if fat loss is an issue for someone? And just why it's so important?

**Mike:** Yeah, that's a really good point. Not only just fat loss, but even exercise performance and recovery and blood circle regulation and appetite, pretty much everything we can think of. You know, I think the big picture that I would love everyone to understand and fully appreciate is, when we think about the critical organs like the heart, or the brain, or the liver, these are tangible. We can touch them, we can see them, on an MRI or a CT scan or what have you. But, your gut microbiome and what that term means is one hundred trillion single cell bacteria. And it's not just bacteria by the way, it's an aside, we have parasites, viruses, and things that we really cannot quantify as readily as we can the bacteria at this point.

And they are not as well understood, but I think in three or four years we will be talking about gut viruses and how cool they are. And we are already learning more about parasites and worms and helminthes and how important they are for our immune system function, for our gut physiology and so forth. So, it's really this collection of microorganisms that's equally as important as the liver, or even more so as important as the liver. So in everything from appetite, digestion, formation of various vitamins and minerals, immune function, the list goes on and on and on. So these things are really important and that's kind of big picture idea number one and big picture idea number two is everything you put in your mouth, your thoughts, how you think, how you feel, how you sleep, whether you are grateful or you are mad at the world, all these different things impact the composition of these bugs. So, we need, this is a whole another, what I like to call, a three dimensional perspective of human Biology forever we have been talking about. Blood sugar, calories, you need to do internal trainings to burn more calories and increase oxygen depth and cause adaptation in your muscles which is very important. But, we also need to think about these bacterias. And so even something like a pre workout drink or a post workout drink, that has synthetic sweeteners. That can cause dysbiosis or their relative imbalance of these microbes. So, that's kind of the big picture there. And what is that imbalance related to the cause? What are the biological factors or mechanisms that are at play here. One that our gut bacteria have been able to do is become very efficient at extracting energy from the food that we eat. So let's just create a hypothetical scenario where you have someone that was born via the mother's vagina, was given breast milk and have a healthy diet and was not given a lot of antibiotics; for example that would be healthy patient one. And then just let's say hypothetically, a patient two who was born via C-section, was given Formula, wasn't breast fed, was given antibiotics, so their gut microbiome is totally going to be different. Patient B would have an unhealthy gut micorbiome because all these early life events play a huge role in the adult composition of the gut microbiome. And let's say they both eat the identical 1000 calorie meal, let's just say it's a protein shake with some almond butter, berries and what not. Patient B that was born via a C-section and had antibiotics, would likely extract a lot more calories from that food than the healthy patient A. So, these bacteria, you know, if you have imbalances in these bacteria, they can extract more energy from the food that you eat. And that energy can form or trigger the body to undergo adipogenesis or the formation of new fat cells. It can inhibit lipolysis or the release of stored fat. These are things called short chained fatty acids, proprionate and acetate in different compounds can perturb fat cell physiology. Moreover, we talk about like, exercise tolerance and recovery and performance and aerobic capacity in power output and these are at the cellular level components, called mitochondria are really at play here. And we know how important mitochondria are for burning fat and all that. But actually the communications network from the gut microbiome stimulate different cellular

switches that turn the mitochondria on and actually cause the replication or the biogenesis or formation of new mitochondria. So from an exercise fixed standpoint, from a metabolic standpoint, we can't overlook these guys. And then it just comes back to you, eating whole real food, being mindful, chewing food and just getting back to the basics and avoiding synthetic compounds, getting good sleep, and balancing your stress as ample strategy is to really optimize the health over gut microbiome.

**Danny:** Awesome! Great breakdown. I wanted to jump back to a couple of things, you mentioned like, one I think is a really important point when you talk about with a state where we have dysbiosis and the difference in calorie extraction from foods we eat. Because so often I'll get people talking, we have these huge debates now right around the calories in, calories out equation and energy balance and people say "well, does it really work like that or it doesn't?" and I say "well, yes. You can get around the energy balance equation". But what you have to understand that it's not as simple as just an input and output because you have things like, for example, the gut biome, that if you change that, no matter what you are putting in as your calories in, you now have a difference in, no matter what you put in your food, you have a change in the outputs there depending on the make up of your gut bacteria. So you are not breaking any energy balance laws, but it is not just as simple as in and out. So that was a great point to just to bring to people's minds. And the second thing that this whole area of gut bacteria has really forced us to do is take a bigger picture view. So, for so long, with our health we were looking at just what does this hormone do, or what does this organ do? And just trying to fix those things where they are, where it's now when we look at the gut bacteria, it's a whole community of things that affects nearly every system of the body. So we have to take a step back and look about what each our actions doing in a bigger scale rather than getting so narrow minded on things. And I am sure, you've found the exact same?

**Mike:** Yeah, it's huge. And I wanna highlight on the first point that you brought up and I don't necessarily wanna scare people and have them really be concerned about their gut microbiome but we do need to keep in mind that for people who have weight loss resistance or they can't lose weight or they are not getting the results they want in the gym, or what have you. They are doing all these right things with their diets as we speak. I think it's important to look back at their life experiences and say okay like, ask your parents, " was I born via a Caesarean section or through my mother's vagina?" even though that's not really... you can phrase it differently, like natural birth versus Caesarean. And then how long was I breast fed? These are simple questions and then so it can help people to understand the physiology that's going on or it may not be their fault. It may not be their diet, it may not be their sluggish metabolism. It really could be that the gut bugs that they have are out of

whack. So, instead of beat yourself up or blame your genetics or blame your sluggish metabolism, you could just really need to undergo, may be even fickle microbiota transplantation, for example. Or this therapy is emerging in the United States and in parts of Europe and it's a treatment for obesity and metabolic challenges. And so I think that is very important for people just to understand that it's just not genetics, it's just not sluggish metabolism, but these gut bugs could be playing a huge role. And to look back at their early life experiences, to see what that role may be.

**Danny:** Yeah, I think that's a great clarification point Mike, because again what we are kind of saying is that if we look back at these different experiences, it's not the highlight and say, "oh, I had antibiotics when I was 6 months old, so therefore, I am in trouble now". It g=has happened, but now at least that you know that you can do something about it. You can pay attention to healing your gut or trying to increase the amount of beneficial bacteria or at least get something done about it. So just being aware of, it is the biggest thing in the first place.

**Mike:** That I will just highlight too: Breaking the vicious cycle of obesity. So I know as many of the listeners will know in the United States, you would walk around and see a lot of overweight children. And it is very sad because the occurrence where their prevalence of previously adult onset babies is, for example, autoimmunity and things that historically in the course of health and medicine only affect adults are now increasing in prevalence in children. So the thing is important not only for us adults to understand this and to optimize our own physiology, but spread this message to parents and parents to be. Because this is a huge point that we need to bring up now, at least in the States. You know, one in three children is born via C-section and that's really problematic because these children are coming into this world, relatively sterile, they have no microbes. And the first microbes that they are exposed to are the microbes on the skin of hospital workers, which is clostridium difficile, a very pro- inflammatory type of bacteria. So it just sets the stage for gut imbalances, inflammation and much more. It's just important for quickly trainers listening to harp on this with their clients to ensure that we have healthy future generations in our societies and communities.

**Danny:** Yeah, for sure. I think the importance can't be understated. Just switching gears slightly Mike, I know another big issue that some people will have familiarity with, others not, is the hormones in the gut. And specifically around society, it is going to be a big trigger for, it's one of the main things for a lot of people, they talk about just, they never feel full or they are always hungry, or they have got this kind of crazy series of cravings at different times and really could be a gut microbiome issue because we have the relation between not only the gut microbiome but also the adoption of different hormones in the gut. Can you talk about some of the

satiety hormones and the hormone production in the gut? And how those can affect our ability to lose body fat?

**Mike:** Yea, really great point. I am so glad you brought that up. You know, basically I'd stumbled upon this. It's been known for quite some time, since actually 1946 I believe, that a humoral substance, a biological substance, is released from the intestinal tract and that communicates with the metabolic system, and when we say the metabolic systems we are talking about like the pancreas, and the hypothalamus in the brain that regulate blood sugar and energy expenditure and appetite incessants. So, it's been known for a long time, you know. We now know that individuals that have obesity, insulin resistance and diabetes, they have a reduction in these signaling molecules from the GI tract, and these fall into the class of hormones called Incretin hormones. Basically, there's about 24-26 different types of incretins. The one's that are most prominent, that folks should be aware of, are GLP1, stands for Glucagon-like peptide-1, and CCK, or Cholecystokinin. And these hormones, they increase just by the sight, smell, taste and chewing of food. So, they actually increase before your food even hit your stomach. And again, what that's designed to do is to tell the body, to help prepare the body for this incoming meal. But the challenge is, and a lot of people when, you know, eating under stress or eating at the wrong times of the day, or, like you mentioned Danny, have impulses in their gut microbiome, these hormones are not released properly. And then, what happens is, the body is not prepared for food and it's not going to break it down or absorb it properly, and partition those nutrients into their appropriate places, like fat tissue, muscle tissue, liver. You know, it's going to be dysfunctional. So, this is a really big deal and it becomes a major problem for two groups of people. People that undergo a lot of yo-yo dieting. Studies show diets don't work. Period. But individuals, particularly that go on a diet, then off and regain all the weight they lost and then gain more back, you know. Those individuals have semi-permanent changes in the release of these gut hormones. This has been validated by well established medical journals. For example, New England Journal of Medicine has tracked overweight individuals that were undergoing a low calorie diet and they had suppression of these hormones 14 months after they embarked on this diet. You know, they were only on this diet for 8 weeks. And this diet was 1400 calorie diet. So, I think the point here is for the listeners is; don't restrict the amount of food that you eat. You know, if you are training heavy one day, then eat big or eat appropriately with how much output you put in it. On rest days or recovery days, maybe don't eat as much. So, that's the thing. And don't embark on these yo-yo type diets. And the other thing too is that the types of food that we eat can bind to these different taste receptors. So, we think we just have taste receptors in our tongue and in our mouth, but we these same taste receptors in our heart, in our gut, in our brain, in our pancreas; all over the body. And so, if we eat more color-rich foods, that would be spinach, kale,

anything with a color, not Fruit Loops or Skittles or junk food, but real whole food based colors, those actually latch on to these different taste receptors. And those taste receptors communicate with those gut cells and release high levels of these hormones. So, even something like white rice, instead of doing white rice, go with the black forbidden rice which has these polyphenols. Because those are going to increase levels of these gut hormones. And then, the other thing we can do to optimize our gut hormones is by the types of proteins we take. So, whey protein and P-proteins have been studied at Duke University in North Carolina and they powerfully increase these hormones.

**Danny:** Well yea, so quickly to talk on the P-protein, because I have only previously seen it as something that was used as a hypoallergenic protein for people who can't tolerate dairy or for vegans who wanted to use a protein source, but then I came across some weird stuff talking about it bouncing satiety and appetite regulating hormones, which is kind of fascinating stuff. Is that how you have found or have you been using that a lot with people? And what sort of effects are you seeing?

**Mike:** Yeah. That is a really great question. I agree. I think initially when P-protein was introduced, it was like "Woah! It's cleaner than rice. We might as well check it out. It's got a better amino acid profile than the other vegan proteins.". But why I was fired up on it is I, you know, have these Google alerts and I get alerts when, you know studies get published on CCK or GLP1, and I came across this one research team in Duke and they studied various proteins and they found that in P and whey protein, whey has very similar properties to as P. But some people get sensitivity and they want to do the elimination diet and so forth. So, those are the two proteins. And basically, it's the amino acid structure. For whatever reason, that amino acid structure communicates with these cells called the L Cells in the GI tract. And that's where these hormones are released from. So, that's the bottom line there. And I think that... Studies show that individuals, whether they pre-load, meaning they take a protein before they eat, or they supplement with protein shakes tend to have more lean muscle mass, tend to burn fat better and have better appetite control on blood sugar control. So, I think it's important not just for athletes that are trying to increase their calories or amino acids post-workout or pre-workout, but I think it's really great for people that are just trying to have a healthy metabolism and burn fat. For folks that tend to, say, over-eat at dinner, or when they go out with their friends or go out with family and have a big meal, it's nice to preload with a whey or P-protein beforehand because just from a biochemical basis, that will stimulate these different gut hormones that will help to reduce appetite so that someone's not going to overeat if they have a tendency to do that. So, that's something I generally recommend. And, you know, some people are not really big breakfast eaters, they



are not hungry or they have gained these proteins in the morning first thing as they really gush into.

**Danny:** That's a really awesome and practical takeaway for a lot of people. I know my buddy James has done that really successfully with a lot of his clients. When we think about the psychology of it, so often if they are talking about changing their nutrition, it can often come across as they are just taking stuff out all the time. So, he gives us a first recommendation. Add in a protein shake as a snack between or before the time that they usually get their kind of slump or these cravings. And what you find is that it's easy for someone to follow there, since you are adding something in rather than taking it away. But now I can go back and tell him that he's got this extra benefit that you talk about bouncing out those satiety and appetite regulating hormones which is pretty cool as well.

**Mike:** Hmm. That's a great tip.

**Danny:** Yeah, so thanks for that, Mike. That was brilliant. And I wanted to pull up one more thing. You talked about the calorie restriction, or the chronic low calorie dieting and effect on the gut area, or gut hormone rather. And I think that's another fascinating point. Recently, we have had plenty people on the show; Aby Smith Ryan, Erik Helms, Sohee Lee, all talk about the various metabolic and hormonal adaptations we can get to low calorie dieting over time. Now that we can see that that also has an adaptation within the gut as well. It's kind of a fascinating point. So again, it kind of backs up some of that stuff so that was pretty cool. I wanted to jump in with one other thing on the gut hormones and satiety hormones. In most of the seminars that I do at the moment, I'd done a section where I talk about how we eat is so important as opposed to just talking about what we eat all the time. It's so important that what physiological state that we are in when we are trying to digest food. And we are taking the time to get ourselves in a parasympathetic state, a rest or a digest state as some might call it. But in addition to digestion, does that also affect the gut hormones and the satiety hormones depending on whether we are in this parasympathetic or sympathetic state. Have you done much on that, Mike?

**Mike:** Yeah. Really great question, Danny. Really glad you brought that up. This is a huge area I think, you know. If there's just one thing that listeners can take away from this is, I think like you mentioned it, it's not about what you eat but it's how you eat it. And your mindset... your mindset is the difference between winning and losing and, you know, success in life or just mediocrity. So, the thing is very important to sit down, be very calm, take some deep breathes, and biologically or, you know, from a physiological standpoint, what's happening is you're activating, as you said Danny, this rest and digest branch of this autonomic nervous system. So, you know, kind of

like your thermostat or your electricity running in the background. You really don't think about it, but it's operating. And in your body, your autonomic nervous system has really two parts: the stress, fight or flight, or the rest or digest. And a major pathway for that nervous system is called the Vagal Nerve or the Vagus Nerve. And so, when you're in this calm state, in this meditative like state, that vagus nerve is supplying fuel or neurologic energy to your GI tract. So, digestive secretions, motility, these gut hormones that we have been speaking about, all these different things are being released properly, at the right levels. Now, in contrast, you know, during your interval training or you're fighting with your boss, or you're in traffic, whatever it may be, that vagal nerve that stimulates the gut is basically turned off. And you know, your adrenals are being activated, all these stress hormones are being regulated. So, it's either or. It's not both. You know, you can't be stressed and digesting at the same time. So I think.... And there's another layer of complexity that, I think, is even more powerful here. When you're in that parasympathetic state, that rest and digest state, you actually turn on an anti-inflammatory signaling pathway. It's called the Cholinergic Anti-Inflammatory Reflex Arc. So, it's kind of a tongue twister, but it's a great way to suppress inflammation. An inflammation is linked with pretty much every disease. You know, catabolism of muscle, increased belly fat. So it's very beneficial not only to balance your gut hormones, to improve satiety, to reduce appetite but we always want to suppress inflammation. And you know, as a side to being inflamed, you really can't burn fat, you can't recover from your workouts, you can't build lean muscle. So, that really speaks for pretty much everyone. You know, we always want to have lean muscle mass and less fat. I think learning tips and strategy is to get into that parasympathetic state, particularly before meals and before bed is critical to everyone.

**Danny:** Yeah. Awesome. Great advice and certainly something people should practically start implementing. With another part of the whole puzzle here, we have talked about the production of these hormones and cells in the gut, so therefore it makes sense that where we get most of the action going on, the actual cells of the gut are involved in this enteroendocrine system. Getting them as healthy as possible is always going to be key. Maybe we can go into a bit about why the health of these cells is obviously so important and maybe some of the things that we can do to promote the health of these endocrine cells.

**Mike:** Yeah. Really great point there, Danny. So, these cells are so critical and what people don't really understand is that when you cut your skin, and you know you have a little paper cut or whatever, you have 7 layers in your Epithelium, it's what its called. It's relatively thick, you know, in your skin. But when you think about the GI tract, it's just one layer. And so that's why, a lot of folks don't understand, you know, when you're drinking excessively or taking over the counter medications, whether it

be it a pain medication or whatever, these things all cause... they not only change the gut bacteria but also cause changes in that single protective cell called the Intestinal Epithelium. And it's so delicate and it's very susceptible to damage. So, the common things that people should really avoid would be the Proton Pump Inhibitor class of medications, the so called PPIs, and acids. Those are really prevalent in the United States, you know, so many people have digestive dysfunctions. But these medications wreak havoc and cause increase in terrestrial permeabilities or leaky gut, which is not a good thing. Any of the pain MEDs, nonsteroidal anti-inflammatory, the Opioid based medications, Vicodin, Oxycodon, those cause some damages. Not only do those cause permeability issues, but they slow down motility. So, motility is like the snake like movements of our intestines that help push things that we eat down to be excreted. We want motility to go North to South. Not South to North. And unfortunately, for a lot of people, they have stagnant motility. And so, digestive, you know, contents from the colon for example, can make its way into the small intestine. We call that small intestine bacteria overgrowth. And that's, you know, pretty prevalent and linked with all kinds of different challenges. So I think it's very much important to minimize exposure to unnatural compounds. This is the bottom line. And another compound that's used recreationally, alcohol, has been shown to be very problematic for the GI mucosa and its protective cells. So, I think everything in moderation, and if you are going to consume alcohol outside of two drinks a day, I would suggest a nutrient called Zinc Carnosine. It's been shown to be protective and help to offset alcohol induced damage in the GI tract as well.

**Danny:** Also, that's another great tip and I haven't come across the use of Zinc Carnosine forces. That's awesome. I'll check that out. On the topic of these enteroendocrine cells, I know one particular way that health promotions for these cells is one compound that we've seen is beneficial is obviously Butyrate. And I know we've heard plenty of this before. And with butyrate, we are able to get that from.... If we are using prebiotics, they can obviously feed these butyrates producing bacteria. Then once we have these butyrate have an effect on these cells. Do you do much with people with prebiotics fibers and if so, what is your kind of take on trying to get prebiotics in food form as opposed to using a lot of the, kind of, supplementary stuff that has kind of become big recently.

**Mike:** Hmm. Great point, Danny. You know, I am a whole foods guy at first. I think everyone should go down that road. I mean, I love supplements. My counter's loaded with supplements. But, we buy from local farms and cook around food, and you know, have a half a grass fed cow in our freezer I mean. So, I think food first is important. So things like leeks, onions, garlic, apples, blueberries; those are all things that have these fibers that we are talking about, Inulin, Fructooligosaccharides and so on, which are very beneficial like you mentioned, not only for the intestinal

epithelial cells. So actually as in a side, I talk about this a lot in the book Belly Fat Effect, that these prebiotic fibers actually increase the level of the L-cells that we are talking about. So, as Danny mentioned, the enteroendocrine cells. So basically, the metabolic cells of the gut. You can actually increase the number of these cells just by taking these fibers which is huge. But not only that, the more bifidobacterium you have and healthy gut bacteria and another butyrate producing bacteria. And these types of bacteria you can increase them through the compounds that we talked about, leeks, onions, garlics, apples, but also taking inulin and then secondarily, the polyphenols. So anything with a color we mentioned earlier, blueberries, raspberries, green tea, turmeric, all those compounds, anything with color, help to increase these bifidobacterium producing bacteria. And in so doing, you have not only a healthy microbiome but also the cells of the gut are very healthy. So the hormones that are going to be released at higher levels at the right time. So, again, food first but I would definitely recommend for weight loss, you know people have a lot of belly fats, stay light and you know, want to kickstart their metabolic physiology, they can certainly supplement with Immulin. And there's ample studies now, mostly in women surprisingly, show that immulin helps to reduce weight circumference by improving the health of the microbiome.

**Danny:** Yeah. Very interesting. That's very cool. I've got to look at a lot of ways to bump up people's prebiotic intakes obviously on top of their food. And do you think there's much to be said about trying to get a blend of different supplementary fibers? Because I know there's a lot of people trying to go down that route of heavy dosing on resistance starch and/or unmodified potato starch. But then I have kind of talked to Dr. Ruscio about this as well and he's kind of.... Is it more beneficial to go off maybe blending some resistance starch from potato starch with then some inulin now and again. Maybe using some pectins or gums or all the different types of prebiotic fibers.

**Mike:** Yeah. Really good point. I think you hit it on the head. Basically you're going to.... Yeah definitely mix it up. These different fibers selectively grow certain types of different bacteria. And although bifido and *F. proznitzkii* are very beneficial, we want things in balance. Just like everything in life. You know you wouldn't do deadlifts every day, or squats every day, or rotate things through. So I think that a really good point is, you know, add in these different gums, vary the amount of fiber. One day, you might have 20g. Another day, 5g or 10g of supplemental fiber. And just change the sources because we don't want to abnormally grow, you know, certain bacteria. And case and point of that would be, we think of like *Lactobacillus acidophilus* or *Lactobacillus plantarum* is being very healthy but studies now are showing that Type 2 diabetics have higher levels of these compounds in their GI tract. And why would that be? Well, these studies show that these individuals tend to have higher

carbohydrate intakes and that's why they have blood sugar deregulations, but that's also why they have bacterial imbalances. You know, again, everything that we are eating, is fueling these bugs and we don't want to overdo any one thing even if it's whey protein or fish oil. you know, everything in moderation. But definitely, I would rotate in these different fibers.

**Mike:** They have higher carbohydrate intakes that's why they have blood sugar disregulation but that's also bacterial imbalances so you know again everything we are eating, is filling these bugs and we don't want to overdo any one thing if it's way protein or fish oil. You know everything in moderation but definitely I would rotate in these different fibers.

**Danny:** You make a great point Mike, about the moderation effect because we pretty much see it with everything. And we're still not really sure of what a perfect gut microbiome actually is, like what is the makeup that we're actually looking for. We kind of have some ideas on which strains have shown certain benefits on certain areas and that we know diversity is probably a very good idea to have but we can't say selecting this group of bacteria is gonna the more you do that the better because they yet they have some benefit of having them there but we don't want this kind of going down one root so that was a really important point and that's the thing I try to across the people we're looking at and healing and getting healthy gut bacteria. One of the biggest mistake people think is all I need to do is go and buy a probiotic supplement and start using that. What is really based on what we're seeing right now is like that's not gonna do anything if you're still doing everything else wrong. Right?

**Mike:** Great point. And just want to highlight on the point you made about metro diversity and that's really keen here. You know you can read one study that says lactobacillus is good for metabolic physiology and another one says o my gosh it's correlated one type diabetic. So I think what we really need to focus on is to increasing metro diversity. Every single study has shown that low metro diversity is linked with chronic disease, whether it's type d diabetes, obesity, heart disease, auto immunity. It's at low metro diversity and that's where we talk about over hygiene and antimicrobial soaps, antibiotics and you know C section delivered babies, no formula you know all that reduces the overall metro diversity. So it comes back to eating a diverse diet. So eating a diverse diet and not the same thing every day and you try vegetables, fruits and proteins that you haven't eaten before. You know like radishes, maybe you don't know how to cook a radish, maybe you never had one but just buy them anyway. Go on google and figure out a recipe and figure out how to cook radishes and then try out swiss chard and the next day try out collard greens and keep switching it up and add in all these different vegetables and fruits in your diet to increase diversity because you're gonna be fuelling different bacteria every

time you include a new fruits preaching on to the quiet but I think a really helpful tip a lot of people need to get focusing on because we get stuck on this comfortable rat you know sweet potatoes grass and beef day in day out but it's nice to switch it up.

**Danny:** Ya and that's another fantastic point when you talk about variety of the foods not just for feeding the gut bacteria but also for the variation we're gonna get in the micronutrient composition but all the other compounds that we can get from food. So I think we get so lost all the time in looking at simply calories and micronutrients we know that these are the main drivers of body composition per se but every time I talk about this fact, I always qualify my stunts by saying why calories do matter, so does food quality. Specifically eating real food and getting the variation you talked about is key because we can get this argument and sometimes I am sure you heard it before where people say, well if I am hitting my calorie in macros, can I not take in multivitamin and still live on processed food. My counter argument is that well there are other compounds in foods and things like phytochemicals and probably other chemicals we might not even be aware of that are beneficial yet. But their all in there that you don't get simply with supplementation and I think one of the big take ups that I got from the book is well you talk about a lot these different compounds and for example like the polyphenols. Maybe we can start with looking at some of these mahbe with the polyphenols as you already mention them. Can you maybe just talk a bit about what they are for people who aren't sure where they can get them and just a bit about their importance overall rather than looking at the bigger picture?

**Mike:** Ya I think that's really important point and you know people often confused you know what should I eat, should I eat yams or should I eat whatever. Anything with colour. So any fruit, vegetable, seed whatever that has a deep dark colour and that would be purple, green, blue, red, orange. These things are chemically defined as polyphenol compounds and their basically this complex you know aromatic rings all stack together and they give off a you know different colours and their designed really to prevent the plant or compound from UV damage. So their very protective fruit example and we think in the states like blueberries, wild blueberries and main. You know main is really north in latitude and the summers can be you know a lot of suns so these berries have all their time to make these polyphenols so that they don't you know basically get killed by the UV damage. But it turns out that these polyphenols are very chemically complex molecules certain bacteria thrive off them and this is a group of phyla of bacteria called the bactredidis and in contrast under which this phyla are very healthy bacteria we've already mentioned sicobacterianpresnicsiae betherabacteriamin and all these bacteria. So just eating a diet rich in colour your gonna fuel this healthy gut bacteria. In contrast, when you coloured devoid compounds white bread and processed food and what have you

there is no polyphenol structure it's just this very simple you know carbohydrates and your gonna stimulate the growth of bacteria that fall under this phyla are pharmecutis in the pharmecutis they have enzymes that are really efficient at breaking down glycands and carbohydrates. So you know just goes to show we all know that if we eat a diet rich in vegetables and fruits and stuff with you're going to be healthier and have blood sugar regulation and pry better appetite and body composition but now we know that one way this happens is because you're feeling good bugs in contrast when you eat a lot of carbs and processed foods. You're feeling batter not bat bugs but bugs which are really efficient at doing stuff with these carbohydrates converting that into short chained fattyacids that make you fat that form a dipogenesis and suppress lypolosis were the burning of fat. So really important just to include more colour with every single meal.

**Danny:** Ya it's such an amazing area and all the stuff behind it is soo fascinating and then when we distill it down to what we do about this, it's like if you eat more vegetables and you eat more fruits that are of a wide variety and it's getting back to the real food you said again and again Mike it's so true and kind of reminds me of when I was doing my masters studies had a tremendous professor that was teaching one of the classes Tony Shihi and he was talking about the phytochemicals and we've done a awful lot of looking through the research and one thing that kept coming up was we were seeing all these research about health benefits behind say dark chocolate or red wine we have kind of distill down yet revertral was the pretty important here. And then so many had tried to do studies where they isolate revertral, use and supplement form but they weren't able to produce the same health benefits as when it was part of a whole foodor that was coming along in a package with something. So there is something going on there where we have real whole food which is really interesting. So I'd love to get your thoughts on the usefulness of say such supplements verses on getting or focusing everything on getting polyphenols and revertrals and all these other phytochemicals from food.

**Mike:** Ya really good point Danny. I think the thing in keep in mind is there are supplements in can be used in the context of supplements like when you travel or if you're trying to accelerate weight loss or you know you're working out harder than you probably should you know a lot of people tend to get into this overtraining trap you know more is better and we know that we should you know for example I'm kind of in this trap right now left it really hard and I'm kind of paying the price today so I'm cranking up my curcumen reservetral and stuff like that. So I think it's important that you know focus on the diet focus on whole fruits but live in a very toxic environment you know there are generically modified foods you know glyfocate and various compounds spread on foods. It's in our air or water you know at least in the US. So it's kind of a mess so you know in our WIFI we have our Iphones

and Ipads near at all times and electromagnetic radiation going on and stress issues and you know the lights in our house and TV I mean all so many different incults. So that's too where part of me says ok we wanna focus on this real whole food but the same time, life is not like life is not like it was two three hundred years ago, even fifty years ago it's completely different. So that is what I think supplementing with these things are beneficial but as you mentioned Danny we wanna focus on quality tool like we talked about. So not just some people say, I need five hundred milligrams of resvertral just because someone said it you know look it that resvertral and look at the percentage of say standardized transresvertral tumor crude ok how much curcuminoids are in here. You want like a ninety five percent curcuminoid material. If you want a green tea extract, you wanna look for the epigallocate gallate DEGC material. So just make sure that if you are supplementing which I do recommend, that you're getting high quality stuff is been tested you know you're getting the bioactives in their highest concentration.

**Danny:** Ya awesome advice and I'm completely onboard with you with that Mike and you mentioned earlier about you're cabinet being full of the supplements as well and in the very same way and it's sometimes higher to fit them in but again it's a been up to use them at the right time but even the bigger picture there is when you talk about knowing the different forms or going to look at what different forms or dosages to use. It's all the same thing about educating ourselves and taking our health back to our own hands and it's not about saying o someone told me to take this supplement it's ok you've heard something about it, now go and check it out. And that's what I try to get in this podcast. We talk about all this great stuff and hopefully, it peaks someone's interest in something and you have to take it further from there and you have to go and work it out. So I think that was really important what you said. So we're kind of coming close on time. Mike we're wanna kind of get through the last couple of questions without keeping you too long. One I'm kind of interested just for my own point of view because when you do go through this book, there is just a ton of stuff I'm in like the research and the depth that you going through is just pretty phenomenol and I'm just wondering, during the research that you always did for this book as you have come here across all this different stuff, is there anything that sticks out to you as that just struck you at the time as being crazy or something that completely blew your mind when you read it and can you think of any of those and what has kind come into mind?

**Mike:** Ya there's quite a few kind of those big aha moments I would say but you know one of them was a discovery of this so called amino metabolism or this notion that you know we've kind of like in functional medicine, the integrate of medical motto you know understanding and appreciating the body is you know comprised in all of different systems that intercommunicate and crosstalk and you know you can't



just focus on improving core to core brain health you know because the brain and the gut are connected and all these different things but really the back to the what I'm trying to here is that amino metabolic model and the immune system and the metabolic system really crosstalk and if you're inflamed or your having inflammation, you're gonna have metabolic dysfunction and if you look at people have metabolic dysfunction like obesity or diabetes, well they are inflamed and so goes back inhaled. So this was teased out by a researcher at Harvard back in the late 90's and he found that a lot of this same sibling pathways that we know to be you know really prominent players in the metabolic physiology are also found in the immune system and for example let's just pick an inflammatory sadacine that drug companies have you know figure out ways to suppress it to help with autoimmune joint disease and rheumatoid arthritis and even IBS so further called TNF alpha. It's kind of the prototypical sydacate well we know that also it dries inflammation, but you know its levels are elevated, I should say it dries inflammation but it also induces influent resistance and you might say well why would it do that well the immune system you know inflammation there's nothing for free in the body you know cytokines and antibodies and all these singular molecules don't just rise out of the blue, it take a lot energy to make these things available and increased levels of white blood cells and mass cells, macrophages and all these different components and so that to me was the most interesting part of this whole thing. You know we're looking at this energy side of weight loss and metabolism and we're forgetting that the immune system is elevated in all these chronic conditions and it's really you know kind of doing the selfish things to increase minimum energy that it has to sustain this inflammation and it's doing that at the expense of the metabolic system and it kind of gets complex but it's you know kind of like if we think about what happened with September eleventh, two thousand one in the United States. You know there's a terrorist attack you know a lot of the financial resources were allocated towards defense you know and so roads, bridges, you know schools, infrastructure wasn't really getting the financial allotment that it used to get because a lot of them taxpayer dollars were going towards you know fighting the war on terror and so that really happens in the body too and kind of take home message here if you think about this like okay, so what can we do about this information is really focus you know if you want someone to lose weight or yourself you wanna lose weight or balance your blood sugar. You also need to fuel your immune system and reduce the inflammation. So the bottom line is that if you're driving inflammation and that can be eating bad foods, that can be prolonged sitting, that can be hypoxia. So just not enough deep breaths and movement on oxygenation of tissues actually causes inflammation so we really need to not only balance bacteria but simultaneously reduce the amount of inflammation in our body and that will optimize whole body health in our metabolic system.

**Danny:** Fantastic point. Great ground up there as well Mike and I think it really thumbs up brilliantly the whole issue around fat losses, especially when it comes to calories. We're definitely not saying calories don't matter, what we're definitely saying is there are other factors like inflammation, we've got biome. All these things that can affect the equation as a pose to just what you eat and just how you exercise so and that stuff on the immune systems just fascinating stuff and you could probably talk for another hour just about that point that you brought up but we're just out of time here so before I get to the very final question, perhaps now it's the best time Mike for you to tell people more about the book were they can catch that, a bit of your podcast and just where they can find you online.

**Mike:** Ya thanks Danny. So the book is Belly Fat Effect. This is found on Amazons so you know there are quite a few people that purchase that in Europe, in the UK and so forth so Belly Fat Effect that's on the Nook and Kindle and so forth and also of people like you mentioned I think you know how we found each other. Danny was had some free video series if you go to Belly Fat Effect dot com, you can obtain and there's one thing we didn't even get a chance to talk about today was this circulating clock system and how you know sleep and sleep hygiene is so important and we talked about digestion and you know there are three different videos that people can obtain and learn more about even leptin for example so that would be my podcast is high intensity health. So that just high intensity health dot com or people can find me in stitcher or itunes and you know very similar you know in my intention that Danny has just you know cover some cutting edge topics with experts and people in the fitness, nutrition and functional medicine field. So that's where folks can check me out.

**Danny:** Awesome sounds. Excellent and with that, I'll live you with the final question Mike. If could advice people to do just one thing, each and every day that will lead to them having a better or healthier life, what would that one thing be?

**Mike:** Gosh, that's a tuff one. Ya I would I'm kinda torn between honestly just being present and chewing your food. You know I go to a lot of medical conferences and you know these are prentesures that are you know helping a lot of patients and they sit down and just gobble down their food and some of these people you know don't have the best blood sugar regulation or they have too much to lose and I think it's something that we're never really taught you know is to be very present, to chew you know forty, fifty bites per swallow and be mindful and grateful about the food that we're eating and eat with groups of people and I think that one thing I know it's so elementary and so simple but it's I mean me you know like you Danny live this, breath it, you know work ten, twelve hours a day and I struggle to be very mindful sometimes because it's like going in fueling up your car you just wanna eat and get

back to what you're doing and on to the next thing and I think that's something that is so powerful for digestion, for blood sugar balance, for release of gut hormones and even just that psychological relationship with food. I think if people could just slow down, chew and eat their food and take a lot of bites before each swallow. I think that would be would improve the health of a lot of people.

**Danny:** Awesome. I'm so glad that you said Mike because it's one the of those things that I try to get to people that you can take the same person, the same time of day, the exact same meal and just put them in two different physiological states and how they digest the metabolic food is just completely different. So I'm so glad you brought up the point and amazing way to end this show. I'm so glad that you take the time out to come on this show. It's been absolutely amazing. Just a ton of information here for people and we definitely have to have you back on and hopefully in the future maybe something in around the circadian clock because you've some great information and that would be a pleasure to have you back on. With that, I'd might say thanks so much for being on the show.

**Mike:** Danny, thank you so much. I would be delighted to come back on anytime. Thanks for all your doing and the great work. You're an excellent interviewer so I really appreciated this opportunity.

**Danny:** So I promised you before the show that Mike would bring the goods and he certainly delivered so much great information there. As you can probably tell, I really really recommend Mike's book especially for those of you at intermediate to advanced level. There are some real gems in there and might get really deep down into some of the research on the some of the topics we mentioned in today's show as well as many others well worth checking that out. And if you the kindle version like I did, it only comes out to about seven quita I think. So amazing value for such a great book I will put the link to the book in the show notes at [sigma nutrition dot com slash episode three one](http://sigma-nutrition.com).