The Fasting Method - Episode #144 Fasting Q&A: Ketones, Fat Adaptation, Carb Loading Before Surgery, Survival Genes, Dairy, and More

Megan [00:00:06] Before we get started with today's episode, I would like to quickly read you our podcast disclaimer.

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[00:01:13] All right. And now we'll get started with today's episode.

Lisa [00:01:19] Hello, everyone, welcome. I'm Lisa Chance, and I'm a fasting coach here at TFM. And we are here today with our very own Dr. Jason Fung for our monthly Q&A. And a warm welcome to our podcast listeners who will be able to listen to this Q&A with Dr. Fung a few weeks after our Community members. This is a monthly Q&A where he answers questions submitted by our TFM Community members. And just a reminder to all of you that he cannot give out personalized medical advice, but your fasting and nutrition questions he's happy to answer. So happy Valentine's Day, Dr. Fung. [laughter]

Jason [00:01:59] Oh, you too!

Lisa [00:02:01] Glad you're here. So we're going to start off right away with ketones. We have quite a few questions about ketones today. And since it's Valentine's Day, I'd like to encourage people to do something heart-healthy today instead of having all that sugar. I've known for a long time the neuroprotective benefits of ketones for the brain, but, wow, all the things I'm getting in the latest seminars on metabolic health is that ketones are amazing for the heart, especially the failing heart. Could you elaborate on this, Dr. Fung?

Jason [00:02:36] There's sort of different fuel sources for the body. So, essentially, your body can burn sugar (which is glucose) or it can burn fat (triglycerides), and ketones are a form of energy as well. So, you take the fat and it goes to the liver. The liver makes ketone bodies and it's a source of energy for people to use. You know, it's mostly for the brain because it crosses the blood-brain barrier, so for people who have symptoms-- you know, some people feel that a lot of the psychiatric symptoms, mental health problems can be traced back to low energy. And if your brain can't use glucose efficiently, then providing it with ketones, for example, gives it another energy source. Then it works better and perhaps you have less depression and certain other mental illnesses. And that's a whole other area that Dr. Palmer and others have started to really explore, which is very, very exciting.

[00:03:31] It turns out that perhaps other organs can also use ketone bodies. So one of the things that people have looked at is the heart. So if the heart is not using glucose properly

and it's not got enough energy, then perhaps it's not pumping as well, so for congestive heart failure, there's some suggestion that perhaps ketones can be very beneficial in that situation as well. And therefore, having ketones around allows the body, the heart to use those ketones and then pump better. So it's sort of exciting. And the practical implication would be that if you are able to get ketones, either by following a ketogenic diet or intermittent fasting can put you into ketosis as well, perhaps it may be beneficial for several of the organs to have this other energy source if they're not able to use the glucose. That's sort of the idea behind it. Obviously, when you should use it, if you should use it, I mean, that all still needs to be worked out in a little bit more detail, I think, but, yeah.

Lisa [00:04:34] It's pretty exciting. Pretty neat.

Jason [00:04:36] Yeah.

Lisa [00:04:37] Another basic question about ketones. "Do you need to be in ketosis to burn fat?" and, "Does being in at least a low level of nutritional ketosis help you get into autophagy sooner?"

Jason [00:04:50] So, in terms of the, "Do you need to be in ketosis to burn fat?" no, you don't have to, fat is triglycerides. So you don't necessarily need to be in ketosis, which is a sort of prolonged period of carbohydrate restriction so that you don't have any carbohydrates, your body has to generate ketones. If you're not in such a prolonged period, you can still burn triglycerides. So that's body fat, is triglycerides, and your body can use those for energy. So people do lose weight using all different types of diets. So with low-fat diets, they never really go into ketosis, but still you can lose weight with them. So you don't have to, they're just different energy sources. The reason people like to watch ketones is that it sort of is a way to be sure that you don't have any carbs. And you know that you're burning fat because you can measure ketones, so that you know that your body is turning the fat into ketones. So it sort of a good way to measure that. And it's sort of a more extreme-- like it's a more higher level of carbohydrate restriction compared to just, say, low carb. Sorry, what was the second question?

Lisa [00:06:01] "Does being in at least a low level of nutritional process help you go into autophagy sooner?"

Jason [00:06:07] Again, not necessarily. So, autophagy is activated when there's no protein. So this is the mTOR pathway which is different from the insulin pathway. MTOR is very responsive to proteins and amino acids, so if you have severe protein restriction you'll go into autophagy a bit faster. And remember autophagy is a very short period of time after-- you know, when you don't eat, you go into autophagy, but then you go into sort of fat as opposed to protein burning, whereas ketosis is more responsive to the sort of sugar/insulin side of things, right? So in terms of macronutrients, you have the sugar/insulin side of things. If you go too low, you turn into fat burning and ketosis. Protein is separate. So protein is not generally a good fuel because protein is sort of building blocks, amino acids. And that's the mTOR system which is, when mTOR goes down, then you activate autophagy. So you don't have to be in ketosis, you could just eat very low protein, for example. But very low protein is not a terribly good diet really. You do need some protein in your diet.

Lisa [00:07:15] Right. And this person-- I hear a little bit of frustration in this person's question. [laughs] "Why does it take such a long time to become fat adapted?" They said,

"Imagine somebody joins TFM, starts fat fasting, only eats 2MAD (two meals a day), no snacking. They soon get into nutritional ketosis. Why is it still so hard for them to start burning body fat for fuel? It would seem that once you can run on ketones that come from their diet, running out of ketones that come from their body fat should be easy peasy, but it's not so. Is it that that they're in nutritional ketosis, but their insulin is still high?"

Jason [00:07:53] Yes, you can have still higher insulin. So if you are insulin resistant, and your levels of insulin start off as very high, then it can take a while to come down, that's for sure. The other thing is the amount of-- you know, if you're in a fat-burning state (which is sort of a ketogenic state), you don't necessarily lose weight, because if you're eating a lot of dietary fat and you're burning a lot of body fat-- so remember, the dietary fat sort of goes directly into the fat stores because it's fat, and then your body just takes that and, you know, it absorbs it through the intestines as chylomicron, the chylomicrons go and release their fat into the body-fat stores. It doesn't go through the insulin, which is through the liver. So when you eat fat, it does get stored as body fat, but then you're burning body fat as well. So just because you're burning body fat doesn't necessarily mean you'll lose overall fat if you're still taking a lot of dietary fat, right? It's just that, when you're in ketosis, it's often a state where your appetite is also sort of suppressed, and you're eating a lot of stuff that's relatively high in satiety, so that people find it's easier to not eat so much and then therefore lose weight. But yeah, there can be several different reasons. Yes, your instance can stay high for a long time. You see this with very insulin-resistant people. And then the other thing is the amount of fat that you're taking. So some people who just eat a lot of fat may have to watch that, because that can certainly limit the weight loss again.

Lisa [00:09:23] This person says, "I've heard that fasting turns on survival genes. Can you tell us a little bit more about this?"

Jason [00:09:32] That's-- I mean, survival genes is not a very medically-- sort of scientifically accurate. There's lots of genes for survival, including ones that store body fat, right? I mean, if you're in a situation where you don't have a lot of energy, then, you know, you may want to store body fat, or you may want to burn body fat. So 'survival gene' doesn't really mean anything. [laughs] It really depends on what genes you're talking about. There are certain adaptations in the body when you fast, so your body gets more used to using fat as a source of energy. So there is a switch from glucose. When you're burning a lot of glucose all the time, which is most people because, remember, the dietary guidelines tell you to eat like 50, 60% carbs-- so most people are eating sort of carbohydrates and therefore they're getting a decent supply of glucose. Your body runs mostly on glucose. If you cut that out entirely, you do have to turn on genes that make it easier for you to use fat as energy as opposed to glucose. So that's the metabolic switch. And sometimes you get this flexibility where you have-- you're able to use both. You have both sets of genes. And then there's different adaptations in terms of the hormones, in terms of what your-- you know, your growth hormone will go up, your cortisol levels will go up, your norepinephrine levels will go up during fasting and then they'll go back down. So it's really specific what genes you're talking about. All genes are sort of linked to survival in the end, so any genes can be considered 'survival genes'. It's just a very nonspecific term.

Lisa [00:11:09] And we know you cannot give us medical advice, but what are your thoughts about the new recommendation to carb load before surgery to calm someone. People are being told to drink Gatorade and all sorts of other things like that. Of course, people should listen to their surgeon's or their anesthesiologist's advice before surgery. However, "Does glucose loading to calm the stress response (you know, the cortisol) outweigh the benefits of fasting for human growth hormone or increasing your GFR?" You

know, of course you don't want to aspirate. You know, that's the reason they don't want you to aspirate, but what are your thoughts on that?

Jason [00:11:51] Yeah, I haven't really seen-- one, I don't know the evidence for sort of carb loading. You know, to me, it doesn't make a lot of sense to be eating a lot of carbs. Most people are eating a relatively high-carb diet anyway, so I'm not sure why you would really want to. I know that for bariatric surgery, for example, people are usually put on a very low-carb diet, so it's difficult. I mean, one of the things that you get with fasting, certainly, is an increase in cortisol. That's just the normal reaction, but that's the stress reaction as well. So, if people are worried, I mean, one day of higher carbohydrates doesn't really seem to be-- like, it's just one day, right? So in the grand scheme of your diet, it's not a huge thing. So, you know, I haven't seen any other data that's super convincing, but I haven't looked at it that closely. You know, I'm not a surgeon, so it's not something that would cross my path that often.

Lisa [00:12:59] "Is there any correlation between fasting and pulse rate?"

Jason [00:13:03] Certainly. I mean, one of the things that you see when you fast is an increase in sympathetic tone, which is that sort of 'fight or flight' response, and that may increase your heart rate slightly. So that's sort of a normal-- that could be a normal response.

Lisa [00:13:17] This person has a diabetic friend who's participating in a study on duodenal mucosal resurfacing (DMR) as a treatment for type two diabetes. And she wants to know, "Does Dr. Fung have any take on this pretty new procedure or an explanation of how it works?" They understand that, basically, it uses heat to remove the surface mucosa in the upper intestine. And when it grows back, the refreshed lining better handles nutrient absorption. But why would this make a big difference in blood glucose or insulin sensitivity isn't clear to them, and they wanted to know what you think on this. You know anything about this?

Jason [00:14:00] Yeah I don't know anything about it. It sounds like a relatively new and some new experimental procedure. You know, the upper intestine is where a lot of glucose is absorbed. So my guess is that if they're sort of destroying part of the surface of the mucosa, then perhaps you don't absorb it as well. So it's not that it's handling it better, it's just that it's just letting it pass through, right? So, essentially, if it passes through, then it doesn't get into the blood, which it doesn't get-- you know, so your blood glucose doesn't go up. So that might be the pathway. I don't know enough about the procedure to know whether it's good or bad. I haven't seen much data either way.

[00:14:44] You know, to me, using heat to destroy the lining of your intestine doesn't sound like a great idea. It sounds quite temporary, because, you know, if you use heat to destroy the mucosa and it doesn't absorb, that's great until it regenerates, and then it's probably going to heal-- you know, just do the same thing. You know, you're attacking an area that's not the problem. That is, if the problem is that the mucosal surface is absorbing too much glucose, abnormal amounts of glucose, then, sure, then that might make sense, but it's not. The surface of the duodenum is supposed to absorb all that glucose. That's its normal function. Like, you're not supposed to le-- if you eat a lot of glucose, you're supposed to absorb it. Your intestine says, "I need to absorb all this," not, "I need to not absorb it," right? So it's not an abnormal function. So when you destroy the mucosa, when it regenerates, it's going to do what it's supposed to do, which is absorb all that glucose. So to me, it sounds like what you're doing is destroying it so that you don't absorb the glucose

and that's going to pass right through you. So that might have a good effect until it regenerates, in which case maybe you do it again, perhaps (I don't know the procedure that well), but, essentially you're not attacking the root cause, which is not to say that it's not beneficial. Bariatric surgery will do the same thing - you just don't absorb - and it does have its place in treatment, right? Some people do benefit quite a bit from it and we have studies that show it.

[00:16:18] So, you know, I'm not against doing medical procedures, but I'd have to see more data to see how it works. But my guess is that that's sounds like that's how it works. You destroy the intestinal mucosa, you don't absorb the glucose, so then you can lose some weight.

Lisa [00:16:34] "What about a TOFI (thin on the outside, fat on the inside) person? Do they need a lot more autophagy because they need to get to that? You know, especially if they have fatty liver, or fatty pancreas? And if so, how should they eat on their eating days? And do they need to do autophagy fasting on their fasting days?"

Jason [00:16:55] It's not really related to autophagy. It's basically more related to-- you see this more with carbohydrates. So cutting carbs is probably the more important thing because that's where you get a lot of abdominal obesity through this de novo lipogenesis where you take carbs and you turn it into fat. When the liver sends that fat out, a lot of it gets deposited in the abdominal region as opposed to the subcutaneous fat. You know, when you eat fat, that fat is distributed into the fat cells, and a lot of that would be in the subcutaneous fat, which isn't quite as detrimental, as opposed to the fat that you get from carbs, where you need to take the carbs, and then your liver has to turn it into fat through de novo lipogenesis and send it out. And that stuff can get picked up very quickly in the abdominal region. So it's not so much autophagy, which is a protein-related issue, it's more that cutting down the total number of carbs is probably the more important thing.

Lisa [00:17:53] "What are the signs of histamine intolerance and can the histamine intolerance get worse over time? Does fasting help?"

Jason [00:18:02] Fasting probably doesn't help, as far as I know. I mean, there are some-- I mean, you could say, in some cases, it can help with some autoimmune diseases and inflammation because, certainly, during fasting you can reduce inflammation. But histamine, specifically - it probably doesn't have a huge effect because it's not really in the same pathway. Like fasting is going to affect pathways that are related to insulin and glucose and metabolism. Histamines are a little bit not really part of that. So, you know, perhaps some people may find a bit of a difference, but I suspect, for the majority of people, fasting is not going to make much difference for histamine.

Lisa [00:18:45] "If autophagy is mostly switched on by the presence of mTOR, could a person (in principle) eat a zero-protein diet, like exclusively pure fat, like MCT oil, even to the extent of not losing any body fat at all, but still ramp up autophagy enough for some protein recycling to aid in loose skin reduction, or maybe even reduce macular problems, skin tags, etc.?"

Jason [00:19:12] Yeah, autophagy is generally a time limited-- it's not like you continuously are in autophagy. So, usually, it's limited to about, you know, 20 to 30 hours or so, and then you go into protein conservation. So if you eat zero protein-- one, you can't really because there are essential amino acids that you have to eat to be healthy, so you really can't eat a zero-protein diet. Just like a zero-fat diet, you actually can't do that

because there are essential fatty acids as well. The idea is that when your body has zero protein, if you do that for a long period of time, your body's going to want to conserve all the protein, so it will reabsorb a lot of the protein, but the autophagy doesn't sort of last forever. It's just the normal breakdown of protein that you're going to reabsorb but you're not going to ramp it up. You know, you're going to ramp it up to the max, theoretically, but it's probably not going to be a lot more than you would see otherwise. And you really shouldn't anyway do a zero-protein diet. It's just not-- it's not particularly healthy..

Lisa [00:20:20] I would imagine so. "How do you get rid of visceral fat?"

Jason [00:20:25] Visceral fat is the sort of abdominal fat. And it's, you know, again, cutting down the carbohydrates and intermittent fasting is probably the most important things that you can do, because what you're trying to do is reduce the de novo lipogenesis, which is where your liver takes the carbs, turns it into fat, and then the liver doesn't want to hold on to the fat and it sends it out. But then as it sends it out, the abdominal organs are sort of the first to pick it up. So cutting down the carbs and intermittent fasting is the easiest. Fasting because, as you start to use some of the fat stores, the easiest ones to use are probably right there in the liver, so it will start to burn it first. You know, so some people who have fatty liver and they have some inflammation from that, one of the first things that we see get better is the liver function with the fasting.

Lisa [00:21:15] Yeah, it's amazing. I had one client. And she was like five pounds from goal. She'd lost like 30 pounds or something, and she was very disappointed that she hadn't made goal, but her liver panel was like, wow! You know, it's like, "Look at what you did there. Your nonalcoholic fatty liver disease is gone and all your numbers are just pristine." So yeah. She said, "Yeah, I'm pretty happy about that." [laughs] Just a little, right? [laughter].

[00:21:44] All right. Somebody has a question about cream in the coffee, right? Can you talk to us a little bit more about dairy and what happens with insulin? You might have a spike at, you know, 15 minutes, in your blood sugar, and then it goes down. Is insulin still rising later on people or not?

Jason [00:22:02] Not a lot with cream. So if you're taking cream, it's a lot of fat, right? So the fat doesn't generally spike the insulin much. It's mostly the proteins and the carbohydrates that do. So, you know, there is sugar in dairy - lactose - but the lactose is not glucose. When you're measuring blood sugar you're measuring blood glucose, and that's why when you eat bread, which is not sugar-- so 'sugar' is a general term for all types of sugar. It's a specific chemical structure. So glucose is what's found in, say, bread, but sugar, like, you know, table sugar is sucrose, which is a combination of glucose and fructose. So these are all different types of sugar. Then there's the lactose, for example, there's maltose, there's lactose that you get in milk. These are all sugars. Blood sugar, though, specifically, is glucose. Everything else isn't really circulated in the blood. So if you eat fructose, for example-- so you can eat high-fructose corn syrup, for example, that fructose doesn't really circulate in the blood and it doesn't stimulate insulin because insulin and-- you know, when we talk about blood sugar, we're only talking about glucose, which is why eating a lot of bread, for example, just means that you have a lot of glucose there. But the other ones, like lactose and dairy, don't really affect your blood glucose because, yes, it is a type of sugar, but it's not the type of sugar that the body is mostly concerned with, which is glucose. So, therefore, the insulin spikes with the lactose are relatively insignificant, and that's why milk is not generally-- like, if you look at the glycemic index, you don't see milk there, even though there's a lot of lactose, which is a type of sugar. It's

not the sugar, specifically, that we're interested in. Fructose. Again, fructose does not raise blood glucose (which is blood sugar), but it does indirectly because fructose gets metabolized in the liver and it causes a lot of fatty liver, and it can be changed into glucose, for example, whereas lactose doesn't really have all those issues. So we don't generally worry about it. And I wouldn't be too worried about the insulin because there's not going to be a huge amount of insulin spike with cream, especially if you're only using a little. I mean, I'm not talking about drinking a cup of cream, just like a tiny little bit. You think about that-- you know, if you put one cream in your coffee, I mean, it's a little thing like that. Yes, there are calories, but it's not going to be-- like, you're going to burn that down. And it's calories that are coming largely from fat as opposed to glucose so, therefore, the insulin spikes are not going to be a lot.

Lisa [00:24:39] And this person is asking, "Why is it easier for women to do longer fasts after they've had a small amount of tubers during the last meal before the fast?" This might be depending on their age or if they're perimenopausal or not? I'm guessing. I don't know. [laughs]

Jason [00:24:58] I don't know. I hadn't heard that. I mean, everybody's sort of different, so some people may find something easier or another thing easier. I don't think it's anything specifically. Like, there's all sorts of idiosyncratic reactions, that is people find, you know, all kinds of different reactions to food. And so in this case, perhaps if somebody finds it easier (or a number of people), but I don't know that there's anything specifically that's-- you know, I haven't heard that, commonly, that people find that.

Lisa [00:25:30] All right, Dr. Fung. Well, thank you so much for answering all our questions today. We had a lot of questions today, so thank you very much. I guess, see you next month. Bye, everybody.