BUSTING SOY MYTHS ONCE AND FOR ALL!

An interview with Dr. Melissa Reilly

Karina Inkster: Dr. Melissa Reilly is here to once and for all bust one of the most pervasive myths within veganism. And that's the myth that soy is bad for us, that it causes man boobs, that causes cancer, that it causes infertility of messes with our hormones. So in this episode, learn what the research really says about soy. You might be surprised.

Karina Inkster: Hey everyone, Karina Inkster here, vegan health and fitness coach, lover of science and lover of soy. We've got Dr. Melissa Reilly on the show today to share with us what the research really says about soy, what has actually been researched, who were the subjects, how much soy were they consuming, what was it compare to, and what was measured. These are, of course, all questions that we should ask ourselves about any research study, but for some reason within the vegan movement, these questions have not been asked enough about the research that's been done on soy.

Karina Inkster: Our guest today is Dr. Melissa Reilly. She is a clinical assistant professor of pharmacy practice at the University of Mississippi. She's also a clinical pharmacist. She completed a post-doctorate residency program in geriatrics and primary care, and she's run nine marathons in nine different states! Melissa's favorite vegan food is tofu curry, and note the inclusion of a soy product. How appropriate for our discussion today. So, let's get to it. Here's my interview with Melissa.

Karina Inkster: Hey, Melissa. Thank you so much for joining us on the show today.

Melissa Reilly: Yes. No problem. Thank you for having me.

Karina Inkster: I'm pretty excited. We are tackling one of the most pervasive and, honestly, probably the most ridiculous myths within veganism today, so I think it's super important what we're gonna be talking about. But, before we get to the bullshit busting, I would love to get a little bit of background on you. So, you're a pharmacist and you're vegan, so why don't we talk about the pharmacist part first. What was your kind of path or motivation for choosing that profession?

Melissa Reilly: Yeah, so going into pharmacy was kind of random. I just took a career aptitude test in high school and one of the suggestions was pharmacist and I was like, all right, let me go for it. I figured a medical doctor seemed a little bit much and then a nurse seemed like they had to do a lot of grunt work, so I was like a pharmacist was a good middle.

Karina Inkster: Hmm. That's pretty funny actually.

Melissa Reilly: Yeah, I know. It's kind of random, but I happened to just become super passionate about it and really found that it was actually something that I'm good at, so here I am.

Karina Inkster: That's awesome. Very cool. So what about the vegan part? How did that come to be? How did you come to choose that as a lifestyle?

Melissa Reilly: I have actually been a vegan longer than I've been a pharmacist. So, I started when I was a kid and I like to joke that it was because of my brother. I was a picky eater. I didn't really like anything, except I liked fruits and vegetables, but I didn't like meat. No chicken tenders for me, no eggs or whatever. So he was telling me, eggs come from chicken butts, and I was like, "Yeah, that's gross. I'm not gonna eat that anymore." And then it made me think about all the other foods that we were eating and that they were coming from animals. And so I'm coming at it as a vegan from an animal rights perspective. Then as I got older, it grew to environmentalism, and then, as I went to school and learned about health, then I realized there was a huge need for veganism for health as well.

Karina Inkster: For sure. Yeah, it just becomes kind of a full-on, well-rounded motivation, doesn't it?

Melissa Reilly: Yeah, exactly. It's good for everything.

Karina Inkster: That's cool. So how long has it been for you then?

Melissa Reilly: It's kind of uncertain because I didn't know what veganism was when I was a kid. I just knew that I didn't want to eat animal products, but there were tons of times where I just didn't know if something was baked, like if eggs or milk were baked into something or … I wasn't thinking about that and probably until high school.

Karina Inkster: Got it. That makes sense. Your story's kind of similar to our guest Melody Schoenfield, who said, "You know, it basically started when I was a kid. I just kind of knew this was the deal." So that's really cool.

Karina Inkster: Okay. So let's get into our myth for today. We're talking about all things soy, which is such … I don't even know how to describe it. It's like a cesspool of myths in the vegan world.

Melissa Reilly: Yes, definitely.

Karina Inkster: There so many different angles and so many different beliefs and conflicting research, so we want to get down to the types of research that have been done and what we can say right now about whether soy is … I don't like using the term good or bad for your health, but that's kind of what we hear in the media, right? So, why don't we start with, what is soy in the first place?

Melissa Reilly: Soy is a really harmless legume, so it's just a vegetable from the soybean plant. It's very high in nutrients, like all legumes are, so protein, fiber, iron, magnesium, and potassium are just some of the things that they offer.

Karina Inkster: And it comes in many forms, of course. So, we've got the soybean, which is probably the least processed form. But then we've got other forms too, right? Foods that are a little bit more processed.

Melissa Reilly: Yes, definitely. So, there's tofu. You can get milk. You can make your own milk, but if you're just buying it, then there is some processing involved in there too. And then there's a lot of soy-based meats, I guess, alternative meats.

Karina Inkster: Right. Like kind of the faux chicken, faux tenders, all that kind of stuff.

Melissa Reilly: Yeah. I'm not huge on those, but I know they exist and they're great for people in transition.

Karina Inkster: Mm, that's a good point. Okay, well then, where does soy get this bad rap from then? Why are there all these crazy myths about it?

Melissa Reilly: I'm not sure exactly how it started, that people just started shitting on soy, but my hypothesis is just that it contains phytoestrogens and I think that word is just kind of … It's a big word, it's a new word, so people have just the estrogen part. That was what's familiar to them, and so they're like, "Oh, soybeans have estrogens." But really, phytoestrogens are completely not the same thing as estrogens. Estrogens only come from animals and phytoestrogens are in plants.

Karina Inkster: Makes sense. Now, is soy the only place you can get plant phytoestrogens?

Melissa Reilly: No, definitely not. They're in a whole bunch of things. I think even rice has them, but hops have them. So I like to say for a lot of men who are like, "I don't eat soy because of man boobs." I'm like, "Well, how 'bout beer?" 'Cause beer actually may have more phytoestrogens than soy does.

Karina Inkster: That's crazy. So, I don't know why it's all just loaded onto soy then. That's kind of ridiculous.

Melissa Reilly: Yeah. I know.

Karina Inkster: I found a list that I might link in our show notes actually. It's put out by the Harvard Health website, and they have a list of foods that have phytoestrogens in them.

Melissa Reilly: Oh, awesome.

Karina Inkster: And it's tons. There's like ramen noodles and pistachios. And of course, lots of non-vegan things like eggs and chicken nuggets and whatnot, but for us, that's a moot point. But, yeah, they're kind of everywhere and also very natural.

Melissa Reilly: Yes, definitely.

Karina Inkster: There are certain cultures that have been consuming soy products, presumably for longer than we have here in the West.

Melissa Reilly: Yes. Asian countries have been consuming soy products forever. I don't even know when it started, but it's been a long time. I know, I'm Japanese, and so whenever I would go visit my Japanese grandmother, even a kid, as soon as I could start chewing food, she would just put down a block of tofu with some soy sauce and sesame seeds, and that was a snack or a meal.

Karina Inkster: That actually sounds pretty awesome. Keep it simple, keep it healthy.

Melissa Reilly: Yes, exactly. Yeah, I loved it. So when I hear a lot of Americans saying that they don't like soy, it's different for me because I was also raised on it. So Asians have been consuming soy products forever. And they also have a substantially lower cancer and heart disease rate than Americans do and I think it could be related.

Karina Inkster: That's a fair point. So, what's the difference between these phytoestrogens then and the estrogens we have in the human body?

Melissa Reilly: Their chemical structure is different. They're just different structures entirely. And then, how they attach to receptors in tissues within our body are different. Because of their attachment to different receptors and their affinity for different receptors in tissues in our body, they're gonna have different effects in our body and for our health as well. So for estrogen it may have negative effects in the breast tissue, but phytoestrogens actually have positive effect in breast tissue.

Karina Inkster: Right, and we're gonna talk about some of the research that's been done in that area as well. Now, you mentioned, just now, the whole man boob thing, which is a huge discussion point within veganism and

even outside of veganism. Anything related to soy, people are like, "Oh my god, I don't eat soy 'cause I don't want the man boobs." What's the deal?

Melissa Reilly: Even some vegan men say they avoid soy. I think they must be new to it, but they avoid soy because they think man boobs. And what I always tell them, one, I had mentioned earlier that beer contains phytoestrogens and most of them drink beer. But also, I've been eating soy since I was a child and I'm pretty flat-chested, so it doesn't work.

Karina Inkster: Ha, that's hilarious! I mean, mind you, that's like a case study of one, but I can fully support that because I'm exactly the same. So there's two, a case study of two.

Melissa Reilly: There's no literature to support that soy products give you man boobs or the official term for it is gynecomastia, but yes, so no man boobs. I did find one case report of a 60 year old man who developed gynecomastia after eating soy products, but I couldn't find any information on him, so not about his medical history, not about the medications he was taking. And tons of medication do cause it, so it could have been confounded by a bunch of different things.

Karina Inkster: Hmm, that's a good point. Yeah, so if we don't know what those are, then we can't really say with certainty that that's what it was.

Melissa Reilly: Exactly.

Karina Inkster: Interesting. Okay, well, let's move onto another myth, which I think is bigger, possibly, than the man boob one, which says something because that's just everywhere. And that is soy and cancer. So a lot of people avoid it because they either have had cancer and they been told to avoid it, or they just want to prevent cancer in the first place. So, what is the deal with this cancer and soy correlation myth?

Melissa Reilly: So it goes back to the misinformation that phytoestrogens are estrogen. So hormone therapies, hormones in general, those can contribute to cancer. But phytoestrogens, as we talked about, are not estrogens, so it's completely different. So, phytoestrogens do have protective effects against cancer and phytoestrogens contain these isoflavones called

genistein and daidzein. So genistein actually stops the cell cycle progression, which is usually what cancer is, it's just these cells that just keep growing and growing. So the genistein, which is in the soybeans, also induces apoptosis, which is cell death. It has antioxidant properties and inhibits angiogenesis. So these are all things that without these mechanisms that stop them, it can just keep proliferating and that's what cancer or tumors are. So the phytoestrogens do the opposite of that because they stop that cycle from happening.

Karina Inkster: Interesting.

Melissa Reilly: Yeah. So the myth that says estrogen, or that soy causes cancer is just misinformation, and miscommunication, misinterpretation of a phytoestrogen and estrogens in hormone therapy causing cancer.

Karina Inkster: Right. Interesting. Now you just mentioned inhibiting angiogenesis. Can you clarify what that is for our listeners?

Melissa Reilly: Yes. Angiogenesis is the creation of new blood vessels and so these are needed for tumors to continue to grow. You don't want that.

Karina Inkster: Right, okay. That makes sense. So I think breast cancer is probably the type of cancer that we hear most about when it comes to soy and potential links and whatnot. So maybe you could go over some research that's been done in this area.

Melissa Reilly: There have been a ton of studies done on this exact topic, but there's lots of literature saying that, lots of studies and meta-analysis which are just a compilation of a bunch of different studies, and they all concluded that soy intake is inversely associated with breast cancer risk. So I know sometimes somebody may have mentioned that a doctor would recommend a breast cancer survivor to stay away from soy products and I think that goes back to just misinformation. So there's a study where they looked at breast cancer survivors, and half of them received soy products or were taking soy supplementation and the other half weren't. What they found was that the breast cancer survivors who were taking soy had lower recurrence rates of breast cancer than those who did not take soy supplementation.

Karina Inkster: Wow. So that's pretty huge. So is this a randomly controlled trial?

Melissa Reilly: Yeah. It likely was. I don't have that actual study with me now, but it probably was since they were looking at the two groups, but I can find that and get back to you.

Karina Inkster: Yeah, because I mean that's the exact opposite of what we're hearing.

Melissa Reilly: Yeah. So everything that we hear I think has just spiraled out of control because there actually really isn't that much literature saying … I can't really find many studies at all that say that it does cause cancer. So I think it's just a fear that people have that kind of spiraled out of control.

Karina Inkster: Right. So I guess media, headlines, sensationalism, and fear mongering is probably playing a super huge role here.

Melissa Reilly: Yeah, exactly, and when you do look at studies, you do have to really critique it because there's a lot of bias that goes into it. You can really manipulate numbers and stats to play into your favor. So there was a randomized controlled trial that was done in 2014 that said, yes, consuming soy products can contribute to your risk of cancer. But when you take a look at that study, which was only 140 women, they were looking at a study of women that already had invasive breast cancer stage one through three, and the study was only done for 30 days. So the actual time that they were supplementing with soy was only 14 days.

Melissa Reilly: So when you're looking at that it's really hard to come to that conclusion that they did, because you have to consider that they already have the disease so maybe it's just progressing. Then also with a duration of 14 days, it's just not long enough to see really any outcome.

Karina Inkster: Right and so again, this drives home the point that you have to know more details, not just the headline. Who were the people who were studied? These people already have fairly progressed breast cancer and how long was the trial, how high was the dose? All of these questions need to be in the picture before we can make really a decision.

Melissa Reilly: Exactly. So to someone who doesn't understand stats or how study designs are done, the headlines can be pretty scary.

Karina Inkster: Yeah. Well, understandably so if that's all we hear and if we don't dig into it deeper.

Melissa Reilly: Definitely.

Karina Inkster: I know that there's been some other interesting meta-analyses done in this whole area. Do you have any more that you could summarize for us?

Melissa Reilly: Yeah, there's a bunch. There's a recent one in 2014, and they included 30 studies. So it's pretty expansive and it included 10 cohort studies and then 20 case control ones. What they found was that high soy intake presented some predictive effects on breast cancer in both pre and post-menopausal women, which is interesting because there were some studies or some speculations that it may not benefit one or the other, but this study actually found no difference between the two.

Melissa Reilly: So also what they found in this study, which I thought was interesting and it kind of goes back to what we were talking about earlier, but they did find that there was publication bias in western studies. So whenever you do a meta-analysis, you do evaluate for the bias amongst all of those studies, but they didn't find that in the Asian studies. So what they found was that there were actually greater protective effects in Asians versus Americans. So the hypothesis there is due to the age of exposure that I talked about earlier, because it is such a significant part of the Asian diet.

Karina Inkster: Interesting. So basically that means that perhaps, I mean this is the hypothesis it sounds like based on this study anyways, the idea is that potentially exposing people to soy earlier in life protects them from cancer more than starting soy exposure in later life or later childhood.

Melissa Reilly: Yeah and it makes sense when you think of it scientifically, because the more oxidation you have in your body, the less healthy you'll be. So if you're protecting yourself against this oxidation for your whole life, then your baseline is very healthy versus someone who's had a lifetime of

poor eating habits and everything, they have to start at a much different level.

Karina Inkster: That's an interesting point. Are there any other studies in that kind of realm before we go on to a different type of cancer?

Melissa Reilly: Yeah, there is really a lot of literature. There's a lot of literature saying that soy products actually are inversely associated with breast cancer risk, but there are tons of meta-analyses. So there's another one in 2006 that basically said the same thing. This one wasn't as large as the one that was just done, it had 18 studies, but they did adjust for a variety of confounders. They looked at age, family history, breast cancer risk, dietary factors. They really looked at a whole slew of things and even with all of those confounders, they still found that there was an inverse correlation between soy intake and breast cancer risk.

Karina Inkster: So they included an extraneous variable basically of breast cancer risk, which is interesting.

Karina Inkster: So does this kind of protective effect happen even if you have a history of breast cancer in your family? If you're predisposed to it?

Melissa Reilly: Yeah, I definitely think so. We talked earlier about the other study that specifically looked at patients that were breast cancer survivors though. So it's not just one study. They looked at it a bunch of times with patients that have breast cancer or a strong family history of it, and they still found that there was that inverse association.

Karina Inkster: Well, that's pretty legit research, especially all these meta-analyses! Honestly, it just boggles my mind why this is not common knowledge. All these studies and this research – maybe because it's not sensational enough. I don't know.

Melissa Reilly: Yeah, I agree. I don't think that people are talking about it, and I think that because people are talking about all the negative stuff, no one's actually looking at the literature. No one actually does the research. So it just goes back to that misinformation.

Karina Inkster: That's crazy.

Melissa Reilly: It just keeps spreading like wildfire.

Karina Inkster: Well this is why we have professionals like you who are spreading the actual research and I think part of the goal of this podcast is for people to be skeptical about everything they hear on it. Everything you say, everything I say – do your own research. I mean that's really what it comes down to, right? We provided a whole bunch of tools for doing research in our first episode – resources and questions to ask about a research study when you come across one. But yeah, it really comes down to doing your own research, and taking everything in the mainstream media with a grain of salt. It's a lot of work, which is probably why most people don't do it, but that's why we have you doing the work for us!

Melissa Reilly: Exactly. In school they taught us the average reading level is fifth grade and now being out in the world, and practicing pharmacy, and having my own panel of patients, I really do see that that's true. The health literacy is very low. When I talk to patients, I always tell them to be their own advocate and to question their doctor. Ask, "Why am I on this medication? Why do I have to take a bunch of these?" Be your own advocate. That's so important.

Karina Inkster: Yeah, but that's kind of hard to do if people don't know where they can get information that they can trust though, right?

Melissa Reilly: Yes. That's true. Yeah.

Karina Inkster: I guess that's a whole other conversation, but yeah, ideally we would be our own advocates – but there are people advocating for crazy shit. That's the problem.

Melissa Reilly: Yeah. That's true. Knowing whom to trust.

Karina Inkster: Yeah, exactly. That can be tough, but I guess that's the importance of making sure that you're looking at things from all sides. So what we're trying to do is bust an existing myth and look at research that doesn't support it, and that supports a completely different idea.

Melissa Reilly: Yes, exactly.

Karina Inkster: So breast cancer risk, I think, is probably one of the main myths when it comes to cancer and soy, but there is some BS that I hear around prostate cancer as well: high intakes of soy being linked with higher incidences of prostate cancer. So what can you tell us about that?

Melissa Reilly: So we're finding that soy is really good for us in a whole bunch of different ways, pretty much for everything. Soy is just super great for everything! So yeah, breast cancer is the most talked about thing and then prostate cancer kind of came up. I'm not sure how that came to be, but anyway, there was a meta-analysis done in 2014 and they included eight randomized controlled trials, but they ended up only reviewing two for exclusion purposes. They did find evidence that supported a role for soy in prostate cancer risk reduction. It was limited by the sample size, there's only two randomized controlled trials and then the study duration, but overall they said that there was a role for it, so it's not harmful and it could be helpful, so why not?

Karina Inkster: That's an interesting point, why not indeed?

Melissa Reilly: Give soy a chance.

Karina Inkster: Give soy a chance, yes, absolutely. It's delicious, so why would you exclude it? There are legit reasons why someone might not want to consume it, if you've got a serious food allergy for example. I've got life-threatening food allergies. Not to soy thankfully, but if that's a legit issue then that's a good reason to not eat soy, but all these common things that we hear about don't seem like they hold up when you really look at the work that's been done.

Melissa Reilly: Exactly.

Karina Inkster: One other type of cancer I've heard linked with soy is gastrointestinal. I don't know if there's been that much research into it, but maybe you could enlighten us on that. Has there been work that's been done on that in particular?

Melissa Reilly: Yeah. Like you said, there isn't as much on this one because it's just a random one, it's not as talked about. Like I said before, we're just finding out that soy is really good for us and a variety of ways. There

was a meta-analysis for gastrointestinal cancer done very recently in 2016. They looked at 22 studies, a 21 cohort, and one case control study. They also found that soy intake was inversely associated with incidence of overall G.I. cancers.

Karina Inkster: This seems to be a trend. Pretty much everything that is being researched … even in controlled trials that have really good study design it seems like we're finding exactly the opposite of what all these myths are telling us.

Melissa Reilly: Exactly. Even when you take a look at individual smaller studies, like if I were to individually look at these cohort and case-control studies you may not find a statistical significant difference, but you can see the overall trend is, typically, positive.

Karina Inkster: I see, that makes sense. In that case, it might not be enough to make the conclusion that soy is inversely related to cancer risk, but it is showing us that it doesn't cause cancer at least, or that it's not related to an increase in cancer risk?

Melissa Reilly: Exactly.

Karina Inkster: Interesting. Any other info in the cancer department? There's one more soy related myth that we've got on the menu, but I was just wondering if there's any other last-minute points on the cancer side?

Melissa Reilly: No, I think we've said it all.

Karina Inkster: I think so. Excellent. Lastly then, there's this myth specifically about infertility. Now, I don't know where this came from, I ask myself that question about a lot of myths, but why is there a myth that eating a lot of soy will make you infertile? Also, is this for women and men both, or just one or the other?

Melissa Reilly: The myth comes from something several decades ago in a small region, a small farming region. This farmer had sheep that were infertile, and so they were doing research on it. It took them another couple decades to figure it out, but where the sheep were grazing was a very specific type of clover that has a very high amount of phytoestrogen in it. What this

kind of clover was, I don't remember, but it's not something that's in our typical diet, so that's where it came from. People are like, "Oh, soy can cause infertility," but if you actually take a look at what that clover had, if you were to try to eat the same amount of phytoestrogen in that clover that would be in our products such as soy milk, you would have to drink over 1000 liters a day of soy milk, or 900 pounds of tofu a day to get that same amount of phytoestrogen.

Karina Inkster: That's crazy. 1000 liters of soy milk or 900 pounds of tofu?

Melissa Reilly: Yes. It's not possible for us to ingest that much phytoestrogen with products that we have commercially available to us here.

Karina Inkster: Yeah really, that's physically impossible.

Melissa Reilly: Yeah. Even as much as I love soy I wouldn't be able to do that! There have been studies on it and, again, they didn't find that this was true, but there was a meta-analysis in 2010 that specifically looked at men. They included 15 placebo-controlled treatment groups, and they found that neither soy products nor isoflavone supplements altered the reproductive hormones in men. They were looking at testosterone, so they didn't find that it altered it whatsoever.

Karina Inkster: Interesting. I would assume that when they're using isoflavone supplements in a study it's pretty high, the levels that you probably also wouldn't find in food.

Melissa Reilly: Yes, exactly. They tested a variety of doses, and still found that it wasn't so.

Karina Inkster: It's like research that I've seen on … there's this myth out there that fructose will lead to fat gain, and when you look at the studies that have found that it's these ridiculous amounts that have been given to the study participants, which is similar to this thousand liters of soy milk. It's basically like, "Hey, here's the equivalent of 100 cups of strawberries." You're never going to eat that in real life.

Melissa Reilly: Right.

Karina Inkster: Again, it comes down to asking, what the heck was actually studied? What did they compare? What's the dose? All those important questions.

Karina Inkster: So the point is not just that soy has no effect on cancer, or on man boobs, or on any of this stuff – it's actually that it's a positive thing, right?

Melissa Reilly: Yeah, definitely.

Karina Inkster: How would you summarize for our listeners your view on soy?

Melissa Reilly: Like you said, the literature is really only showing positive things even if it's not saying that it cures cancer, or anything like that it's not causing it, and it really doesn't seem to be harmful at all. There's a lot of evidence showing that it's been helpful for us and, like you said, it's delicious, so I definitely am pro-soy, I am on team soy all the way.

Karina Inkster: Obviously, I am too! It's a fantastic source of protein, so people who are athletes, such as yourself, will need that to fuel training, and it's a good quality protein as well. Unless you have a legitimate allergy or medical condition, then I'd say go for it.

Melissa Reilly: Yes, agreed.

Karina Inkster: That's awesome. Thank you so much for teaching us about the work has been done, and what was studied, and what it found. I think it's really important not only to know about the research that's out there, but also to be able to share it with other people in a way that makes sense. I think it's a really good skill to have. I'm very appreciative of you coming on the show.

Melissa Reilly: No problem. Thank you for having me.

Karina Inkster: Thanks so much Melissa for being with us today, and for doing some serious bullshit-busting when it comes to soy.

Karina Inkster: The moral of our evidence-based story here is that soy isn't just harmless – it's actually extremely beneficial. It's a very high quality protein which, of course, is important for us vegan athletes. Unless you're legitimately allergic to soy, there's no reason to leave it out of your diet. Head over

to nobullshitvegan.com/011 for our show notes that are full of the sources Melissa used in her research in case you want to check those out for yourself. I've also linked to an article from the Harvard Medical School on isoflavone content of various foods, that was mentioned in our interview, and a bonus resource, which is an article written by Susan Levin who is a registered dietitian and the director of nutrition education for the Physician's Committee for Responsible Medicine. She writes also on the research that's been done on soy.

Need a kick in the ass to nail your fitness and nutrition goals - on a vegan diet? Wanna have a structured plan to follow and accountability to your own coach, while being able to work out anywhere? Check out my **4 coaching programs**, and apply for one of only a few available spots!