**The Health Edge: GMOs and Health**

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| Mark: | Welcome to The Health Edge, translating the science of self-care. Great to be with you as always and thanks you for listening in. I am Mark Pettus, and I’m with my friend and colleague, John Bagnulo. John, good morning, buddy. |
| John: | Good morning, bro. How are you doing? |
| Mark: | Excellent. Great to connect. Nice to see you as always. |
| John: | Absolutely. |
| Mark: | Our recent report, John, by the National Academy of Sciences, which is an independent agency that reflects best evidence, recently reported that genetically engineered foods and GMOs are really, when all is said and done, pretty safe for people, pretty safe for the environment. The report did note that GMOs have not met the promise of increasing abundance of foods, but this was pretty much of a green light for genetically engineered foods. When I read that, I thought that you and I ought to comment on this a little bit, because I think that this is one of those issues that continues to be much deeper than how it may appear on the surface. |
|  | With a lot of interesting research that often doesn’t make its way into the kinds of trials that a scientific committee like this might look at. I know, a lot of interest that you have in this, John, and something that the science continues to get more interesting around, very worthy of just a response. I thought maybe this morning, we could look at that report and comment a little bit on how we see genetically engineered foods in the context of day-to-day life and ancestral lifestyles and see where that goes. |
| John: | Yeah. I mean there’s a lot of layers to this, right? I think for the vast majority of people who are interested in getting to the bottom of genetically modified food, I think they inherently see the words genetic and start to think, you know, wow, I don’t really know what that means. Like, what does it mean to actually splice the gene of one organism, one plant, whatever it is, into the genetic blueprint for another organism, plant, animal for that matter? I think, again, for a lot of people, it starts to become almost abstract. It’s not something that is as tangible as let’s say, we're applying a pesticide to food. |
|  | I know there’s going to be chemicals on that particular piece of produce that I eat. People start thinking, genes, how do these genes that are incorporated into this corn that I’m eating? How is it that that could possibly influence any aspect of my health, because my genetic's considerably different. I'm nothing like an ear of corn. I think because of that, it’s just far enough outside of what people can, again, really wrap their heads around for people to fully appreciate what we’re talking about. Again, there’s so many layers to this onion, the more you peel back, the deeper you get. |
|  | Then that starts to lead you to infinite numbers of possibilities, for environmental changes and you name it. I think the most important thing to start with in all of this is to let the listener know that when you have what we call transgenic material present in anything, whether it’s corn or it’s in … Now, we have, of course, genetically modified salmon. I’m not sure how many of our listeners are aware of that. Anytime you have transgenic material present, that, in nature is very, very … hundreds of times more likely to then pass that genetic material on to the milieu, let’s say, of microorganisms within the GI, the microbiome that you and I talk about so much, Mark. |
|  | Those microbes are always exchanging genetic material from our diet with their own genes. You know, again, this is basic biology. This is what is referred to as the microbial soup theory, which is if you have a large population of bacteria in contact with everything from viruses to a host of other organisms, they’re swapping genetic material. Now, when you introduce food which has this transgenic component, it has a particular percentage of its genes which have been inserted artificially in a lab to create this … You know, in the case of corn, whether it’s glyphosate-resistant corn, or it’s Bt, bacillus thuringiensis corn, those genes are going to be much more easily swapped with the microbes in our GI. |
|  | There’s again, a very, very small study that was looking at physicians actually, who volunteered to be part of an ileostomy study, and they looked at the microbes within their small intestine. The microbes within the small intestines of these physicians … I think, there are only half a dozen or a dozen physicians in this study, they had that transgenic material already incorporated into a significant percentage of the microbes within their GI. What we’re really talking about here, Mark, is the introduction of genetic material into plants, and how it is then subsequently passed on to the microbes within our GI. |
|  | Now, that means we’re changing the nature of the microbial characteristics, the families, because we’re exposing them to this highly- transferrable genetic material. This is the part that is not appreciated really by these different organizations that are trying to tell us it’s safe. They’re not just digging deep enough or pulling back enough layers of this onion to get to what I consider to be the real core threat to human health, but even more importantly, to global health. |
|  | Because once you start swapping genes with … whether it’s insects or it's other plants, you’re really going to start to change the vast nature of the ecosystem that we live in. I just think that when you start to look at this, the way that … whether it’s the USDA's perspective or other organizations, they’re really not looking at it. They’re looking at this as a toxicity type of event, and that’s not what we’re talking about. We’re really talking about changing the genetic composition of the bacteria that make us who we are. |
| Mark: | I think this story is so much more nuanced than what the average consumer would take away from reports like this, John, and what’s out there. One of the things that strikes me is just what you’re saying. When I looked at the report from the National Academy of Sciences, and they reviewed over a thousand published studies, and a lot of what they looked at are these epidemiologic studies. If you look at the prevalence of certain diseases in, let’s say, the European Union, where genetically modified foods are banned, and you compare the prevalence with, say, America, you may not see dramatic epidemiologic differences. |
|  | That sort of becomes the basis upon what you say, look, these foods don’t appear to be bad for human health on a macro level. Nowhere in that analysis is there the depth of consideration around the microbiome. This is such a profound area as we are realizing more and more with each passing day. There’s also this separation, John, that I think is also a bit misleading and that … We’ll come back to this in moment, because we often talk about science, and science equals truth and yet … The science we’re looking at, the methodologies, the interpretations just don’t always lend themselves to the narrative that is much more likely to be present and important, and so there are always these inherent limitations. |
|  | Often, what I find when I’m reading any report about the safety or looking at any controversy with respect to the safety of genetically modified foods, John, they'll look at the food itself. They’ll say, if you compare genetically modified soy with soy that’s not genetically modified, the macro/micro nutrient content of that soy is not dramatically different. The nutritional value of that soy does not appear to be dramatically different, therefore there’s no reason this wouldn’t be safe for human consumption. That sort of forms the basis of that narrative, and I think there is some truth to that. Correct me if I’m not interpreting it right that, you know, when you look at the nutrient density of the food and … you know, for the most part, there aren’t dramatic changes that jumped out of you. |
|  | I know there’s some controversy as well around organic versus non-organic, and though I think with organic foods, you do tend to see some differences in nutrient and content and density. The genetically engineered discussion is one that tends to look at the end product and how different it is, and if doesn’t appear to be that different, there’s no reason to be concerned about safety from a human consumption perspective. The glyphosate, the Roundup-ready, which is so pervasive in all genetically modified foods, and is present in soil and water and breast milk and urine of people around the world, that’s really where the story gets interesting. The collateral piece to this, which is probably enormous and profound in its implication, kind of gets lost in some of this translation. |
|  | The science, I’m not sure, has … There are these interesting pockets of research, and I know you know this research very well, but it’s hard to sometimes see the constellations, because some of these things can take a while to measurably impact human health on a macro epidemiologic population level. Right now, most of the science we have sort of looks at it in that very generic way. The glyphosate story, I think, gets more and more interesting. The impact, whether it’s the transgenic or the metabolic impact on the human microbiome, I think we haven’t even begun to get our heads around. When you start looking at glyphosate, as you would be quick to point out, John, this is much more than genetic engineered food. |
|  | Glyphosate is finding its way into foods that the average consumer would never even be thinking about. It's pervasive issue when you look at it from the perspective of glyphosate toxicity Roundup, glyphosate and the other ingredients in Roundup that clearly are being shown to impact key and critical metabolic pathways in the microbiologic world. That almost, by definition, has to be concerning in terms of the health of the planet as well as the health of people consuming these foods. You know, you just don’t get any of that when you read these reports. I think that’s an area that we can dive into a little bit more, because these pathways are really pretty interesting. |
| John: | Yeah. They are and that’s the most important point that I feel we need to make. When we’re talking about genetically modified foods, GMOs, the two major families of GMOs are those plants which have had the gene from a particular bacteria known as bacillus thuringiensis spliced into them, which allows the corn or soybean plant or other plant to “naturally” produce a type of pesticide. Again, it’s being produced by the plant, it’s not being topically applied, a type of pesticide that literally creates a high level of permeability or perforations, small holes in the intestinal tract of the worms that would otherwise dine on these plants. That’s one major family of genetically modified foods. |
|  | The other major family and then there’s these smaller families like when we talked about salmon that’s genetically modified. Those things are literally Frankenfoods, where that salmon is reaching a mature size and weight in about two weeks as opposed to several months. We’re talking about the two most major families of genetically modified foods. We’re not going to get into genetically modified fish and things like. If we look at the two big families, you have the bacillus thuringiensis family of genetically modified foods, so they’re producing a natural pesticide, and then we have those plants which have been genetically modified to be resistant to this herbicide you’re talking about, glyphosate. |
|  | There are other glyphosate-like molecules such as glufosinate, which heavily used in places like Brazil. A lot of people are starting to raise serious questions about what’s going on in Brazil and the amount glufosinate in that environment, and you start to connect the dots. I hope we can have Stephanie Seneff on here really soon. I’ve had some really intriguing conversations with her, and some discussions with one of the co-researchers with within Stephanie’s world, Anthony Samsel. What they’ve shared with me, Mark, is that when you take a look at glyphosate and glufosinate, two very similar molecules, they’re so pervasive in the modern food supply, it is frightening. |
|  | The levels which are being found in not only your genetically modified foods, which are exposed to very high levels, but also in [just some 00:15:16] … a lot of your organic foods, especially organic grains, lentils, organic flax. These things have all been shown to be heavily contaminated with glyphosate in particular or Roundup, for our listeners who want to know this in more layman’s terms. You know, we’re talking about Roundup here. That’s the trade name for the chemical, glyphosate. Here’s the deal, you can’t really get genetically modified … You can, I mean, in a lab. Unfortunately, this is what the industry does. |
|  | The manufacturers of Roundup, when they conduct these tests, or for those people who are talking … Greenwashing, that’s the best way to describe what’s going right now with genetically modified foods. It’s greenwashed by the industry. We’re told that there’s no nutritional differences. We’ve been told, right, that it was going to solve the world’s hunger problem. You know, all these things that we’ve told about genetically modified foods, one after another, they’re starting to be shown to be much more fiction than nonfiction. You can’t separate, in the natural food supply that we’re exposed to, the glyphosinate and the genetically modified foods. |
|  | You wouldn’t be producing genetically foods if you weren’t going to be applying higher levels of Roundup to them. That’s just what people have to understand is that, I think, the greatest risk with consuming genetically modified foods despite what we don’t know yet about the long term effects of these transgenic components being swapped out with the microbiomes, the families of bacteria that we want to play a really important role in generating short-chain fatty acids and things like that. That’s what we don’t know. |
|  | What we do know is that when you have genetically modified foods in your diet, you are going to axiomatically have a higher level of glyphosinate in your diet. You know, glyphosates are … Just for our listeners who … This sounds really technical. Even saying the word glyphosate or glufosinate, it’s a mouthful for people that don’t deal with this or talk about this daily, these molecules are highly interchangeable with the amino acid, glycine. These 20 amino acids … Mark, I know, you know this, but I just … for our listeners. There’s 20 amino acids … [crosstalk 00:17:38] |
| Mark: | Yeah. Run with this, John. |
| John: | Okay. |
| Mark: | This is so fascinating and so important. |
| John: | Okay. There’s 20 amino acids that our body uses to make proteins. Every single one of those amino acids is in essence, it’s a letter in this alphabet or this code that the body uses to make everything, from the proteins in our muscles to enzymes to neurotransmitters, you name it. Everything has a certain amount of protein. Those proteins are going to be made from amino acids, and then that code is really important. You know, the thing about this herbicide, Roundup, or glyphosate is that it can easily be interchanged with the amino acid, glycine. |
|  | When that happens, it totally changes the function of that protein. You can’t simply put … If you take any word in the English language, for instance, and you throw a different letter in there, it changes what that word means, how it looks, how it reads. The same thing happens in the human body. When you throw in glyphosate in place of glycine in to any protein, it’s going to change that protein completely. This is a big part of the problem with Roundup. Again, we talk about what’s it going to take for the scientific community as a whole to recognize … I mean, there are. Don’t get me wrong. I mean, the World Health Organization, they recognize has a glyphosate as a carcinogen. It’s being recognized globally. |
|  | What’s it going to take for the USDA and the FDA to even start testing for this in this country? Because right now, they have no testing in place. In fact, you can be a certified organic manufacturer, you can be a producer of organic food and you don’t have to test for glyphosate. There’s just no infrastructure in place right now within the United States in terms of testing for this herbicide. Which again, when you start to take a look at global organizations, they recognize it is a carcinogen, but it’s not really looked at as a significant threat to human health yet in this country. |
|  | What’s it going to take for people to start to really wake up and acknowledge the fact that this is highly toxic, has a significant half-life, persists in the environment in a number of different ways, and is being shown as you mentioned earlier, Mark, it’s in everything from breast milk to urine samples to blood samples. It’s in bodies of water, and these are all different avenues for which it can end up in areas of our food supply that people would never expect it to be. As a toxin, Roundup or glyphosate, as its chemical name is, it is so pervasive and it is so disrupting, because of how it can be incorporate into proteins and disrupt the normal protein sequences that call for very important functions in the human body. |
|  | This is problem with genetically modified foods, is that if you have GMO corn or Roundup-ready corn … You know, living here in Ohio, you can’t watch a ball game without seeing advertisements for Roundup-ready soybeans, and the marketing is always the same. Greater productivity, greater yield, less … This is what I find really interesting, less chemical use, which is totally misleading, because the research also shows and any farmer will tell you this, that you need more and more Roundup every year because the weeds are becoming Roundup resistant. |
|  | It’s a lot of greenwashing, it’s a lot really marketing to farmers and to consumers in a very misleading way. I think from a health risk perspective, glyphosate is the greatest risk. Glyphosate exposure is the greatest with consuming genetically modified foods, because most contains significantly more than your conventional produce and, of course, your organic produce. That’s the part that I think most people just don’t understand is you can’t … you really don’t separate genetically modified foods from glyphosate, and you get more glyphosate with your genetically modified foods. I think that’s the part that most organizations … including organizations that I like, like the Center for Science in Public Interest. |
|  | They’re not really talking about glyphosate exposure. The whole Just Label It campaign … For our listeners who might not be familiar with this, there’s this initiative to just label it. In states like Vermont, they've kind of taken the helm here, they’ve taken the lead, so to speak, with this and are steering this. Then you’ve got the Non-GMO Verified project, and they’re trying to do good things, but none of these organizations are testing for glyphosate. When you start to look at what has been tested for glyphosate levels, usually by independent companies … Our company, Functional Formularies here on Ohio, we tested all our products for glyphosate levels, and we've been very pleased to find that there’s no detectable glyphosates in all of our organic products. |
|  | Unfortunately, there are a lot of organic foods with high levels of glyphosates in them because they’re being used not only to keep weeds down, but they’re also being used to brown the crop, especially grains. There’s some really interesting stories going on right now with barley. A lot of barley is being rejected by breweries because your barley contains such high levels of glyphosates that it disrupts the fermentation process, because of how many microbes that the glyphosate kills. Yeah, there’s a lot of layers to this. It can be overwhelming for people to hear this, but I think that there’s so much evidence around glyphosate exposure and how detrimental that can be to human health. That is reason 1A to avoid genetically modified foods. |
|  | Then when you start to look at the potential for transgenic material being swapped with families of bacteria in our GI and how that can really shift the balance of important families. How that can make some people much more susceptible to deficiencies and Bifidobacter, and having clostridia overgrowth. When that happens, you have a whole 'nother host of problems. Yeah, I mean I think that … Again, if people are people are waiting for that … As you know, in medicine, Mark, too many people are waiting for that n=10,000 clinically-controlled studies showing X, Y, and Z. |
|  | If you’re waiting for that with genetically modified foods, it’s going to take years for people to start to show how the microbiome changes with six weeks or six months of dining on genetically modified foods. If you’re willing to connect the dots in terms of what’s been already shown in the ecosystem in and around areas where genetically foods and glyphosate levels are high, I think you should give people, at the very least, you should give them pause before you sign up for more of these foods. |
| Mark: | Yeah. Great overview and comments, John. I think we’re seeing the tip of the iceberg here. As more of the research, much of which won’t make its way to some of the mainstream journals that may form the basis of what a scientific committee will look at as they perceive quality evidence, whether it’s the toxicology literature or … What we’re finding in terms of the microbiome, I think, is really pretty incredible, John. Even though translating that into the potential effects on human health is still hard to do, it’s impossible not to have concern over that. I think you mentioned this, John, the Roundup, glyphosate really is anti-microbial, right? It’s an herbicide. |
|  | As we understand more about some of the pathways in the microbiologic community, bacteria, fungal that glyphosate impacts, it impacts in a very significant way. These are major metabolic pathways. What we talk a lot about sulfation. One of the impacts that we know that glyphosate has is on methionine, which is another amino acid that contains sulfur, and it’s a key player in sulfation throughout human biology. We know that methionine levels are significantly reduced with even parts per trillion … parts per trillion. |
|  | Again, it’s kind of for a hard listener to say, what does that mean? These are microscopic levels that would fall well below the radar screen of any testing threshold. You know, this is death by a thousand cuts, right? It’s impossible to appreciate how disruptive at microscopic level these molecules can be. If you look at sulfation as an example, and we’ve talked a lot about sulfation from a detoxification capacity, from a vitamin D effectiveness capacity. We know that pathway in methionine levels tend to be very low. Particularly, we look at autism and allergies and in inflammation, often there are clear correlations there, John. |
|  | Then you look at this key metabolic pathway that only exists in the bacteria world, the fungal world, this shikimate pathway. S-H-I-K-I-M-A-T-E for anyone who wants to look at that, this is a major metabolic pathway in the microbial world that allows these microbes to produce. We call them aromatic amino acids. We’ve talked a lot about amino acids, it’s glycine and glyphosate as a glycine mimicker, right, getting into every protein, remaining below the radar screen. I mean, this is a subtle, uninvited visitor into all of aspects of protein physiology. When you start looking at these aromatic amines like tryptophan … |
| John: | Phenylalanine. |
| Mark: | … yeah, phenylalanine, tyrosine. |
| John: | Right. |
| Mark: | We know that these are major players in all aspects of neurotransmitter function like serotonin and melatonin and the extent to which that can drive all aspects of human health. I think it’s obviously a major issue. I think we know that many aspects of metabolism are impacted by this. While the translation into human health, I think, is still questioned, it gives you a significant pause when you look at how fundamental this is in altering microbial biology, and by extension, human biology because we’re commensal organisms, right? |
| John: | Absolutely. |
| Mark: | I think that’s another area that just off the top, whether it’s endocrine disruption or neurotransmitter, these pathways are all significantly altered at a microbiologic level, and to some extent, human health. I think that’s just … it gets lost in translation. I think this is one of those areas, John, that like so many things … Hey, you’ve got a … Hey, good morning. |
| John: | I’ve got a visitor here. |
| Mark: | Yeah. |
| John: | Clay has joined us. |
| Mark: | Hi, Clay. I know that Clay is not getting much exposure at all to genetically engineered foods. |
| John: | [Crosstalk 00:30:10] |
| Mark: | Hard to avoid that exposure. I think when people begin to look at … People like Anthony Samsel and Stephanie Seneff, when you start looking at some of that research, it’s hard not to come away with concerns that whether the soy itself is the issue, is one question, but whether the collateral fallout from … The glyphosate is just an entirely different way to look at this and it’s much, much more concerning. |
| John: | Yeah. In a way, Mark, it’s really incredible to think that the manufacturers of glyphosate have somehow lost the effect that it has on microbes. Because when these things were designed, they’re designed to effect nonwoody plants in the productions of those aromatic amino acids, and it was kind of like a major ooopps. You know, we just seem to somehow forget that bacteria are also influenced by this, and these particular families of bacteria are highly sensitive to the shikimate pathway. It’s really important to note that the Bifidobacter families are the most sensitive, and that’s what you see typically disappear first and are affected the most severely by even minute amounts of glyphosate exposure. |
|  | As you know, Mark, once Bifidobacter families become less represented and you have marked reductions in short-chain fatty acids of the butyric or butyrate families, those are the most important, right, for really … That is the currency within the GI. I think your point here about the shikimate pathway is a fundamental one. Again, it all comes down to amino acids, that’s how glyphosates disrupt aspects of biology. Then think about this, why is it we eat plants? Is it just for vitamins and minerals? No, it’s for antioxidants, and all of these antioxidants are highly ringed, right? They rely upon phenylalanine or tyrosine or tryptophan, these benzene ring-containing amino acids. |
|  | All of your polyphenolics or antioxidants rely upon those amino acids as their core foundation. That’s what they’re built around. Once a plant has compromised aromatic amino acid production, it’s going to have markedly reduced polyphenolic substances produced, so it’s going to have lower antioxidant value overall. Yet, another casualty when it comes to this aspect of agriculture, genetically modified in a way of being glyphosate or Roundup-ready glyphosate resistant. This has been shown at places like UC Davis, that’s University of California Davis, which is a major research center for looking at how agriculture or aspects of agriculture influenced the nutritional properties of foods. |
|  | They have shown, not with genetically modified foods, because in those studies, they don’t use glyphosates. This is what we’re trying to go back to this. When research is conducted on the nutritional differences between genetically modified foods and your conventional foods, they don’t use glyphosates. They grow the two foods, the genetically modified one, and the conventional one, they grow them side-by-side in the exact same soil medium, but they don’t spray them with glyphosate. |
|  | When you treat a plant with glyphosate, that’s when you get a marked reduction in the antioxidant content of the particular fruit or vegetable, and this has been shown. There are a lot of different avenues you can go down when you start to talk about these glyphosates, how they disrupt amino acid placement in proteins, and how they can influence the microbiome eliminating particular families of important bacteria, and then how it is they influence the antioxidant or phytonutrient content of plants, which is in my opinion, one of the greatest reasons to eat more plants. |
| Mark: | Yeah. That’s great, John. As we bring this home, I think it’s fair to say this is a controversy that’s going to continue to go on for a long, long time. When you look at many of the mechanisms that we’re discussing and the subtle and significant ways that they can impact human health on a large population scale, it could take a long time for the “definitive evidence” to emerge if it ever emerges. For the individual consumer, particularly, somebody listening, John, who might be at a critical stage around sort of epigenetic and microbiome consideration, planning a family, raising young children, I think we’re just seeing the tip of the iceberg in terms of the potential for the disruption that can come from ongoing exposure here. |
|  | If we’re going to guide folks and I don’t think anyone would be surprised by this. Certainly, we’re going to try to guide folks to minimize the burden of glyphosate exposure that comes via this genetic modification and this browning process, John, that you touched on, which is a whole 'nother eye opener when you start looking at “organic” oats and lentils. I guess, buyer beware. Who knows whether labeling will be forthcoming, but people should definitely be mindful that the report of the Academy of Sciences is talking a very, very, very high level look at the science, which is … it really doesn’t reveal the complex nuances of the many ways in which this relationship is playing out in human health. |
| John: | Absolutely. I think that avoiding genetically modified foods is a really good first step. For our listeners who are doing their best and they’re trying to eat as much food that are organically grown as possible, I think those are … Don’t get me wrong, those are I think really important parts of this. I think it’s also really important, Mark, for people to understand that grains are … cereals and grains are, hands down, the single greatest vehicles for glyphosate. |
|  | If you get your grain consumption down, you’re probably going to be doing a … even if it’s organically grown, you’re going to be doing a great … A great part of the problem will be reduced, because grains are just where that browning process becomes … and fortunately, it’s a normal part of agriculture now and it’s on a really large or industrial size scale. |
| Mark: | Yeah. That, I think, is great news to use, John, and just another reason to have a bit more caution with respect to grain consumption, even what most would be consider higher quality grains … [crosstalk 00:37:04] |
| John: | Absolutely. The second thing, Mark, that you know, I know that Anthony and Stephanie could speak to in greater detail. Again, we bring up their names, they’re really a … they’re a couple of voices in the wilderness here in the United States or in North America. When you get over to Europe and to others in the world, there are far more voices, but in this country, here in the United States, you just don’t have as many researchers who have taken the risk, career wise, reputation wise to take on this topic, because in academia, it really puts you out there. |
|  | Most universities get major, major funding from the manufacturers of glyphosate or glufosinate and these other components of the genetic aspect of agriculture, so genetically modified agriculture. They’re just the voices in the wilderness that we’re so fortunate to have them here in North America. Over in Europe, there are a much larger number of researchers that have really started to dive into this. The other aspect of our food supply that is heavily contaminated, this is an important one, are anything that contains gelatin. I’ve learned that 100% of gelatin capsules, gelatin ingredients in this country contain glyphosate, because gelatin as you know, Mark, is extremely high in its glycine content. |
|  | When things are really high in glycine, naturally, it just becomes much more of a concentrated source of glyphosate once that glycine displacement starts to take place. Gelatin is something people really should keep an eye out for. I really have not seen an organic gelatin product out there. There may be one, but I hadn’t seen it yet. This is important for people who are using large amounts of supplements. You just want to try to get those supplements made out of cellulose, vegetable cellulose if you can as opposed to gelatin. I just thought I’d add that because it’s another real significant source. |
| Mark: | Yeah. That’s great, John. I know, we will visit this topic on many occasions down the road. |
| John: | Sure. |
| Mark: | We appreciate our listeners turning into The Health Edge. Feel free to checkout our website, the HealthEdgePodcast.com. We’re always uploading reference articles and any information that may be relevant to whatever we’re discussing. John and I would be the first to admit that we’re intrepid explorers here just as our … We’re consumers just as we are sort of caregivers and these stories continue to evolve. It’s just so interesting to really look at this landscape because there’s a lot more information there than what the average consumer receives. This whole topic, John, I think is a gigantic example of that. More to come. Feel free also to check us out on iTunes and give us a thumbs up if you find this content useful. |
|  | Please feel free to share this information with friends and family. You know, John and I, it’s not about selling stuff, it’s not about selling us. It’s just about sharing some information and following this amazing story as it continues to unfold. We’ll also get some links to some YouTube content with Anthony Samsel and Stephanie Seneff, which for people who really want a bit more of a deep dive, can hear more of sulfation and the shikimate pathway and, again, the many ways that we’re recognizing as ecosystems of life, that aspect of our ecosystem is being very, very disrupted by a lot of what we’re talking about. You know that there are more to come here, John. |
| John: | Absolutely. It’s been great, Mark. Thank you. |
| Mark: | Yeah. You as well, John. You take care and be well and we’ll reconnect soon. If our listeners have any questions, feel free to send them in and we’ll address them as we can. John, be well, my friend. |
| John: | You too, buddy. Take care. |