From Genes to Plate: Personalizing Nutrition with Ahmed El-Sohemy, PhD (ep – 54)

Ahmed El-Sohemy: If you increase your consumption of fruit, vegetables, and whole grains, you might not necessarily feel that different, but the research shows that that's going to greatly reduce your risk of heart disease, diabetes, and all forms of cancer over years and decades.

[00:00:19] **Ginger Hultin:** Welcome to The Good Clean Nutrition Podcast.

I'm your host, Ginger Hultin, an Integrative Registered Dietitian Nutritionist. Today, we're exploring the world of nutrigenomics with my colleague, Dr. Ahmed El-Sohemy. Dr. El-Sohemy did a postdoctoral fellowship in the Department of Nutrition at the Harvard School of Public Health. He's a professor and associate chair of undergraduate education at the University of Toronto and the founder of the company Nutrigenomix, with an X.

He's a world-renowned expert on the subject and actually he's the one that inspired me to become a certified nutritional genomic specialist, which I did last summer. In our first episode of the series, we did an overview of nutrigenomics, so if you missed that one, you're definitely going to want to go back and take a listen.

It's going to give you a good foundation for our discussion today, because we're talking all about testing and how to use that specific information to make changes to your health. The field of nutrigenomics is actually relatively new. When I got my master's degree in nutrition, it wasn't part of our curriculum because it just wasn't being taught yet.

And that wasn't so bad. Super long ago, when I got an opportunity to work at a nutrigenomic personalized nutrition startup in 2015, I jumped at the chance. That experience was so transformative to me because all of a sudden I could take general recommendations, which is the foundation of Classic nutrition training and deeply personalize it into something that people were so excited about.

So for the past five years in my private practice, I've been using nutrigenomic testing with many, if not most of my clients. And what I love is the joy that it brings people. The answers to people that might've been adopted or don't have their family history or are struggling with a mysterious health issue that all of a sudden we see on paper and get some answers that help solve the health mystery and makes people feel better.

Welcome back. In our first conversation, we talked in depth about Neutrogenomics, what it is, how it can be utilized to personalize health and nutrition, some of the limitations out there. As a refresher, as we get started today, can you explain in the simplest language what Neutrogenomics is?

[00:02:33] **Ahmed El-Sohemy:** I consider nutrigenomics to be the science that deals with understanding how our nutrition interacts with our genetics.

And really, two sides of a coin. We know that nutrients can turn on and turn off various genes. And the flip side of that is looking at how variations in genes, differences in the genetic sequence, can explain how we respond to the foods that we consume. So, every gene comes in different forms. You can think of them as being fast acting or slow acting.

And if you have the fast-acting version of a gene, then maybe you absorb nutrients from the food. More quickly, or you can break them down more quickly compared to someone who has the slower version of that gene. And that ultimately determines how much of those nutrients your body stores and utilizes.

And the ultimate goal, of course, is to give recommendations to individuals based on their unique genetic profile.

[00:03:36] **Ginger Hultin:** That is perfect because today we're going to talk specifically about answering the question, great, so now what? Can you explain a little bit more detail about what that test is and how it works on your end?

[00:03:50] **Ahmed El-Sohemy:** We have a saliva test as well as a cheek swab, so two different types of collection devices, both noninvasive. You either spit in a tube or you take a swab and brush the inside of your cheek to get some cells. That is sent back to our lab and we isolate DNA from that and then we look at 77 genetic markers spread out across the genome that have specific metabolic consequences.

So, we talked last time about lactose intolerance, that's one genetic marker. We talked about gluten intolerance, there's at least six genetic markers that predict a person's risk of gluten intolerance. Things like caffeine, there's a specific marker that determines whether or not your body can break down caffeine efficiently or not.

Based on the analysis of these 77 genetic markers, we create a customized report that tells you for each of those different nutrients, whether or not your result is typical, or whether you have a higher risk of not responding to that or having low levels of a particular vitamin. And that report goes back to you, the dietitian, and you review that with your client to help them determine what aspects of their diet they need to focus on.

[00:05:17] **Ginger Hultin:** I get the question a lot, like, oh, do I have to go to a lab, do I have to give blood? And it's so awesome that it's completely noninvasive. Like you said, a cheek swab or a saliva test, it just is so simple, and then you just drop it in the mail.

[00:05:28] **Ahmed El-Sohemy:** The question that I've heard sometimes You get your genetic report, you follow the recommendations.

How do I know that it's working? For some things, you can actually feel. Let's say you're told you need to limit lactose consumption, and let's say you discover you have a gluten intolerance, and you limit that, you will feel that pretty quickly. But for other things, you can't actually feel it. And that's okay, because it's actually improving your cellular health, which is Improving your overall health in general.

You can't feel that your liver cells are all of a sudden doing better or that your muscle cells are functioning more optimally. An analogy that I give is something like, If you increase your consumption of fruit, vegetables, and whole grains, you might not necessarily feel that different, but the research shows that that's going to greatly reduce your risk of heart disease, diabetes, and all forms of cancer over years and decades.

The research has demonstrated that.

[00:06:33] **Ginger Hultin:** Yeah, it's more of a long game. And you're right, if I tell somebody to eat more choline, they're not going to feel that, or I get asked that a lot about supplements. You know, sometimes I'm having people take fish oil or take vitamin D. Some rare people, I would say, have some subjective improvements or changes, but most people aren't going to notice that difference.

But inside, they're going to be at less risk for chronic disease or do much better 10, 20, 30 years down the road.

[00:06:58] **Ahmed El-Sohemy:** That's right. But as you say, for some of them, they will actually feel a difference and let's say their overall energy or they're just feeling less fatigue because they found out that they need to increase their intake of say vitamin D or iron, or maybe in some instances, as I talked about last time, maybe decreasing their intake of some micronutrients.

[00:07:19] **Ginger Hultin:** It's important to work with nutrigenomics through a health care provider. You have mentioned that the outcomes are better, the behavior changes better. You're more likely to understand it and stick with it longer. So dieticians, physicians, maybe even nurses, what are the benefits and protections to consumers when you choose to get this interpreted professionally?

[00:07:43] **Ahmed El-Sohemy:** We made the choice to offer Neutrogenomics only through healthcare professionals. We could have done it direct to consumer, but we chose not to because we think it's the most responsible way. Consumers have all kinds of questions. Once they see their genetic report, they get very excited. I have yet to meet someone who looks at it and like, ah, this is boring.

Right. They're like, wow, tell me more and tell me how I can do this and how I can do that. You know, we talked about choline, right? Most people have no clue what kinds of foods choline is found in or how to increase their consumption of fiber, as an example. So that's why it's important to have that healthcare professional, but it also adds an additional safeguard because you're using your professional clinical judgment, as well as knowledge of that person's health.

Food preferences, maybe some food aversions, maybe food allergies, right? And that's why you can't have a report that says, Oh, eat more fish. If a person has an allergy to fish, you're going to know that as their practitioner, and you're going to say, don't consume that, but let's look at flaxseed or other sources of omega 3 fats.

[00:08:49] **Ginger Hultin:** You mentioned that people are really excited when they open their test. It is exciting and it's really fun. And there's all sorts of interactive things you can start to dive into. I also sometimes find people are a bit overwhelmed because when they open it, there's so much information and they do not know how to interpret it.

So a lot of my clients, I will say, Hey, if you're super excited, jump in. And then come to me with questions and we'll go into it together. But if you're feeling nervous or anxious about it, just wait. And then I'll walk you through every step of it. Okay.

[00:09:18] **Ahmed El-Sohemy:** That's a great way of providing that information.

And we've heard different things from different practitioners. Some refuse to give it to their clients until they're actually sitting beside them. Whereas others, like you say, give it to them in advance and usually with some information in advance to say, look, there's going to be a lot of stuff here.

Don't be alarmed by what you read, it just means those are areas that we can actually do something about and let's meet next week and let's go

[00:09:45] **Ginger Hultin:** over it. I do like to ask if people want to have it or not. It's about 50 50 and I love that. It's again, more personalization.

I'm excited to share an innovative new product. Orgain's highly anticipated lactose free protein powder, Better Whey, is now available. Unlike animal-based whey from milk, Orgain's Better Whey Protein powder is created through a gentle fermentation process inspired by traditional methods, yielding a high-quality protein source.

This results in a lactose free, hormone free, and easier to digest product. It's made with 10 times less water, 10 times fewer greenhouse gas emissions, and requires 1. 5 times less energy consumption when compared to traditional whey. It tastes really great too. Each serving contains 21 grams of high-quality whey protein isolate, 5 grams of branched chain amino acids, and 1.5 times the leucine of traditional whey. To learn more, visit Orgain.com.

Ginger Hultin: What have you found has been the provider adoption rate and experience for using these tests? What's that been like for you over time?

[00:10:54] **Ahmed El-Sohemy:** It's been quite interesting when we first launched in 2012 and the test was available only through registered dietitians. We definitely had the early adopters that are like, this is awesome, sign me up.

But then we had some that were on the fence who were like, well, I didn't really learn this in school in my dietetics program. I don't know if this is within my scope of practice. I'm going to wait. And then there's that third group, the small

group. They've heard about genetic tests, but they've only heard about some of the negative aspects and they're like, no, no, thank you.

So over the years, we've seen a huge shift towards the adoption from those skeptics, getting them into the, just learning more and appreciating the science more and learning what it can and cannot tell you, dispelling some of those myths. But more importantly, the ones that were on the fence. We had this questionnaire when a new practitioner signs up and we asked them, how did you hear about nutrigenomics?

And I remember just a couple of years ago, one dietician said, Oh, I heard Dr. Elsohemi present at the Dieticians of Canada conference in 2012. So it was like years later, but only now, as they've seen some of their colleagues offering the tests, they realize, okay, well, if she can do it, I can do it. And then they sign up And we provide full training and resources for them to realize that it's not complex genetics.

It's not that difficult to understand a person is a slow metabolizer of caffeine. You don't have to know complex molecular genetics or The specific area in the genome, no one's going to ask you that, and it doesn't really matter. You just need to know this person really should limit their intake of caffeine.

And as practitioners, especially dieticians, have come to recognize that this is really in their domain. This is their area of expertise. Even though it's a genetic test, it's not diagnostic. helps shine light on what aspects of a person's diet you as a nutrition professional need to help by using your counseling skills to get them to meet those DNA based recommendations.

[00:13:12] **Ginger Hultin:** I push back on people all the time that argue that maybe it's not in our scope or, you know, we're not ready yet. It's just not true. Dietitians have really intensive background in anatomy, physiology, microbiology, biology, o chem, regular chem, biochem, and behavior change and interpreting translating them to be actionable.

So to me, it's all of those things and you don't have to be a geneticist to do this, but you know, we all have the background and the foundation. Even if you didn't learn nutrigenomics in school, there's really amazing courses out there. Your company provides awesome education. There's certifications you can get.

So dietitians and other healthcare providers are really uniquely qualified to be experts in this field.

[00:13:54] **Ahmed El-Sohemy:** Absolutely. Nutrition to some extent is almost everyone's business. Because we all need to eat, and especially if you're going to an integrated health clinic where you have a physiotherapist, a chiropractor, a nurse practitioner, and a registered dietitian, that kind of reinforces the message, because we have in those clinics, and from all these different healthcare professionals that have gotten their own genetic test, and they talk to their clients about that.

They're like, oh, this is what I've done with this. For more UN videos visit www. un. org It's not like you're divulging deep dark secrets about your genetics and how it's going to increase your risk of early dementia or anything like that. People talk freely about their genetic result and dieticians themselves as they're going through reports.

I don't know if you do that yourself, you can say, Oh, I can relate to this because I have that same marker and here's what I've done with that.

[00:14:45] **Ginger Hultin:** Oh, for sure. For sure. I love talking about my results. It's really fun. And it's just like, I don't know, it's, it's commonality with people. And I think it does normalize.

Also, there is no good or bad. For me, I just have a really hard time getting my vitamin D levels up. It's just been a really ongoing issue. And I know why because of my genetics. I feel passionately about taking fish oil for myself and working on omega threes. Is there anything for me? You wanted to share from your own results that shaped with how you look at your own health and nutrition.

[00:15:15] **Ahmed El-Sohemy:** I remember when we first had our report, which was a seven gene report, and vitamin C was one of them. And I remember I had that elevated risk variant. I didn't start taking vitamin C supplements, but I was just more mindful of consuming just a half a glass of orange juice every morning. And that's all you need really to get almost your full daily requirement of vitamin C.

So that's just a small thing that I did. And I mentioned with the caffeine gene, just lowering my intake about that. I didn't have to worry very much about iron, choline, calcium. Those are ones that I didn't have a higher risk for. But I know that I try to eat a fairly well balanced diet so that at least I'm getting the basic requirements for those.

But that's not something that I have to pay particular attention to. I also have the sweet tooth gene. And this is actually a discovery that we made in our lab. Where it doesn't mean that your sugar recommendation should be different. It just tells you, you have a greater propensity to over consume sugars almost mindlessly.

It's this glucose transporter that's expressed in regions of the brain, tell you whether or not you've had enough sugar or you consume more sugar to get that same signal to tell you, okay, now it's time to stop. I have that version that is basically impaired sensing of glucose and I need to consume more sugar for my brain to recognize that I've had enough and it's time for me to stop.

That just makes me more mindful of that. Especially around Halloween when my kids come back with all kinds of chocolates and I take some to the office, I'll have just a small piece because I enjoy some sweets once in a while. And then I'll stop because even though I might be craving another one, I can't stop.

I just tell myself, okay, that's my GLUT2 gene talking to me now. Just wait a little while and eventually that signal will reach. So, knowledge is power and recognizing that I have this predilection for sweets, it just makes me mindful before I reach for a butter chart to say, okay, just be careful. Look for something, perhaps a healthier choice, like an orange or an apple that can satisfy that sugar craving without getting you that loads of sugar and saturated fat and everything else that comes from a delicious butter tart.

Once in a while, it's not bad.

[00:17:44] **Ginger Hultin:** For sure. And that's a really important takeaway. It's, this isn't like you have to do this or that. Like we make collaborative decisions. You know what your brain is doing and how it's responding. And then you can just. Yeah. Think about your nutrition and health differently.

So one thing I like about these nutrigenomic reports is just how moderate they are. And it's not super prescriptive. You can just prioritize and it's not like never eat any sodium again. It's like, how do we take steps to reduce? Or like you said, vitamin C, we're not loading people up with supplements.

Maybe you just need a little bit of OJ or eat a cup of berries. So it's very actionable. And I like that about it because To me, I found it very empowering.

[00:18:26] **Ahmed El-Sohemy:** Yeah, these are the aspects of your diet that will stick with your client or with you as an individual. I remember bumping

into a friend of mine just recently that I hadn't seen in a couple of years and I'd given him a test and he's like, you know, I'm still not drinking regular coffee now.

I'm still on decaf. So all those years, because that's what he remembered most about that report and it motivated him to cut back on caffeine.

[00:18:52] **Ginger Hultin:** I wanted to revisit the legal implications of genetic testing. Are there any legal implications you can think of now or anything that you think is going to change in the near future as the field continues to move forward?

[00:19:04] **Ahmed El-Sohemy:** Currently, as I mentioned before, there is in the United States the, the GINA Act, Genetic Information Non-Discrimination Act, meaning that insurance companies and employers cannot ask you information about your genetics. In some documents, if you're asked if you've ever had a genetic test, I think you have to declare if you have or not, but no one is permitted to ask you your results of your genetic test.

And what's even more important is, even if an insurance company knew my Neutrogenomics report, I would give it to them. Because there's nothing there that's going to possibly prompt them to impact my premiums, right? If they find out I'm a slow metabolizer of caffeine, if I'm an insurance company, I wouldn't know what to do with that information unless I'm monitoring how much coffee everyone's consuming, right?

But they don't even ask you about how much coffee you consume. before you're applying for insurance. And the same thing applies for employment with any company. So there are these legislations that are in place that protect consumers so that they don't need to worry about getting a genetic test.

[00:20:12] **Ginger Hultin:** I am excited to have this rolled out more and recognize more.

There's so many ways it could be used in medicine. I hope that someday it's part of, every time you go to the doctor, like, do you think that's possible? Eventually.

[00:20:24] **Ahmed El-Sohemy:** We currently do that now to some extent by way of newborn screening. So every baby that's born in probably every province in Canada and every state in the United States, undergoes a battery of

tests that we used to call genetic disorders, but a large number of them are actually managed by dietary means.

A classic example there is a condition called PKU or Phenyl Ketoneuria, which is an inborn error in the metabolism of an amino acid. And that causes severe neurological dysfunction. So everyone that's born in Canada, United States finds out very quickly if they have that. If they do have that genetic alteration, then they're put on a very strict low phenylalanine diet for the rest of their lives.

But that really saves their life, because it prevents these severe neurological disorders from developing at a very early age. The question is, can we apply that to other chronic diseases that occur later on in life, like diabetes, hypertension, etc. Different forms of cancer. The science is definitely pointing in that direction, but there needs to be.

A political will and justification from a cost benefit analysis, I think, which is what politicians like to see before that they can implement those kinds of policies to get everybody tested, which hopefully happens sometime soon.

[00:21:53] **Ginger Hultin:** So what is next in your research? I know you've always got a lot going on at University of Toronto.

[00:22:00] **Ahmed El-Sohemy:** We're working on a number of different projects. So we've done research on cardiometabolic diseases like hypertension, heart disease, diabetes. We've done research in women's health, looking at premenstrual symptoms. We've done research on men's health, looking at male infertility. And it turns out that 30 percent of cases of infertility are actually due to the male factor.

And it turns out that the diet of the male impacts sperm health that influences the likelihood of conception. And the health of sperm is influenced not only by nutrition, but also by genetics. And so, we've recently published a couple of papers showing that Blood levels of certain micronutrients like vitamin B12 and iron influence male hormone levels like testosterone that influence fertility.

But we see this variation in the population, so it's quite possible that for some men they need more B12 than others. And so the next step in our research is to look at some genes that could predict who might need more of a particular micronutrient to optimize their fertility potential. So, uh, women's health, men's health, cardiometabolic disease, we've also looked at athletic performance.

And we published a paper a number of years ago looking at caffeine and endurance performance. So we know a lot of endurance athletes consume caffeine. It works for some, not others. In fact, it makes things worse for others. And again, there's a gene for that and that's also included in our report.

[00:23:38] **Ginger Hultin:** I've been following your work closely for a long time and it sounds like there's going to be a lot more coming out in the next few years and it's just going to keep shaping this field and I can only hope that more folks have more access to it and know about it and use it because it can be really transformative to your health.

[00:23:54] **Ahmed El-Sohemy:** The word is definitely spreading in terms of the science and its application. You're hearing more and more about discoveries that are being made, and not just by our group, but by many other research groups now that are focusing on this area of what we're calling precision nutrition, and trying to figure out how we can use not only genetics, but in other cases, other biomarkers to figure out what works best for an individual.

[00:24:23] **Ginger Hultin:** This is such an interesting topic. I'm so glad that we got to meet today and learn so much from you. It's really helpful.

[00:24:29] **Ahmed El-Sohemy:** I really enjoyed our conversation.

[00:24:30] **Ginger Hultin:** Our show is sponsored by Orgain and produced in collaboration with Larj Media. That's L A R J Media. Thanks for listening to this episode of The Good Clean Nutrition Podcast.

To stay up to date on the latest podcast episodes, be sure to hit follow on your podcast app. And if you like this podcast, I'd love for you to let us know. You can rate and review this show on Spotify and Apple Podcasts, or you can give us a thumbs up on YouTube if you're watching right now.

I'm Ginger Hultin. You can find me online at gingerhultinnutrition.com. Thanks so much for listening.

medical advice, diagnosis or treatment. Always seek the advice of your physician or other qualified healthcare provider with any questions you may have regarding a medical condition or treatment and before undertaking a new health regimen.