



**University of Manitoba: “What’s the Big Idea?”
Series 2, Episode 6 Dr. Meghan Azad**

INTRODUCTION:

INTRO MUSIC STARTS

Dr. Azad:

“I think every project, every good project needs a good acronym. So, MILC is really unique... it was conceived and co-founded by myself and my colleague, Dr. Nathan Nicol,... we can look at this breast milk sample we analyzed today 10 years from now, how is it related to their health? And so that’s really unique in the world. There’s no other place that has that ability. So it’s going to be a really unique resource for breastfeeding and breast milk research.”

[The Gold Standard of Infant Nutrition, Melinda Gates](#)

July 2018

0’24-0’41 ‘Hi this is Melinda Gates...Breast milk is the gold standard of infant nutrition everywhere in the world...’ end with ‘it could prevent up to 800,000 deaths every year.’

MUSIC SWELLS

Dr. Azad:

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MUSIC SWELLS AND FADES OUT

Hello, I’m Michael Benarroch, President of the University of Manitoba. Welcome to season two of my podcast, “What’s the Big Idea?” I’m excited to share more conversations with big thinkers from the UM community who are contributing to the cultural, social, and economic well-being of Manitoba, Canada, and the world. Together, we’ll unpack the “big idea” their work explores. With topics ranging from health research to climate science to social justice, there’s something for everyone.

In this episode, I sit down with Dr. Meghan Azad, a professor of pediatrics and child health at the University of Manitoba. She holds a Tier 2 Canada Research Chair in Developmental



Origins of Chronic Disease and co-directs the new Manitoba Interdisciplinary Lactation Centre or (MILC). Her research focuses on the role of infant nutrition and the microbiome in child growth. She is one of the world's leading experts in human milk, and we discuss how understanding this superfood can help create a healthier world. Enjoy!

MICHAEL:

Dr. Meghan Azad, welcome to What's the Big Idea? It's such a pleasure to sit down with you today. You're someone I speak a lot about because a lot of big names know you very well. In fact, I had the opportunity when I was in Washington recently to run into Bill Gates and he and I spoke about your work.

It's such a treat to sit down with you today. I think Bill Gates would be jealous. Welcome. And I've started all of these podcasts by asking the same question. What's your big idea?

DR. AZAD:

Yeah, well first it's a pleasure to be here. I didn't know the story of you running into Bill Gates, so that's fun to hear. And I think you've put it really well that, you know, this amazing food, this substance, the only food that's evolved to feed human beings, that none of us would be here if it weren't for breastfeeding and the generations before us. And yet we know relatively little about it. So my big idea is that we need to study and understand human breast milk as a complex biological system.

And so it's this superfood, you know, superfoods a buzzword, but I think if one food really deserves that name, it's breast milk. And we, for a long time, haven't been studying it enough. And the research that has been done has looked at it kind of in these discrete buckets, right? So nutritionists might study the nutrients, endocrinologists might study the hormones in breast milk, microbiologists will study the bacteria. But the truth is all of these components, they exist together in the same matrix, in the same milk, and they probably interact.

So if you study them separately, you're going to miss a lot of the magic. And so what I think we need to do is really shake up the way we study breast milk and think of all these things interacting together and get people with those different expertise together on one team to really understand how milk works as a system. And there's a whole field of systems biology and those scientists work in fields like immunology to understand how the body system works to support our immune system. And we should be doing the same thing in human milk science.

So that's what I'm trying to bring to this field of research and I think there's just so much to learn from doing it that way.

MICHAEL: So we'll delve a little bit more into some of these issues, but I wanted to kind of go back at the kind of higher level. You became the scientific director of the International Milk Composition Consortium and it's not just that Bill Gates has heard about you. He's, you know, the Bill and Melinda Gates Foundation has funded your project to the tune of 6 .6 million dollars.



So can you tell us exactly what it is you're investigating? You talked a little bit about it, but why you think you get so much attention from the Gates Foundation and other funders?

DR AZAD: Yeah, so I have a lot of different projects all focusing on breast milk in different ways, and the core of that approach is this systems approach, and I think the reason I bring that is that my own background is combined in biochemistry, genetics. but also epidemiology, so sort of the fundamental core science of what's in breast milk, but also the population health perspective of, okay, how do we support women who want to breastfeed? How is breastfeeding supporting health at many different levels? And so that multidisciplinary approach, I think is what caught the attention of funders like the Gates Foundation.

MICHAEL: And you've expanded this now. Yeah, yeah. To a number of different countries, right?

DR AZAD: Exactly. So...Up until that point, I'd been doing research with the child study, the Canadian Healthy Infant Longitudinal Development Study, which is fabulous. I've been working with them for over 10 years since I myself was a trainee, a postdoc. And then when I started my own lab, I started working with them. I'd been studying the gut microbiome, these important gut bacteria up to that point. And when I started my own lab, I sort of realized, you know, breast milk's important for these gut bacteria. I want to know more about the breast milk. So I started that research here.

Started analyzing thousands of breast milk samples from Canadian families. In that case, we were more interested in things like food allergies, obesity, problems that are more prevalent here in Canada. But of course, breast milk's also relevant to these other conditions that are prevalent elsewhere in the world. So the study funded by the Gates Foundation, we are sort of piggybacking on some of these other studies they had been running. So one is in Tanzania, one is in Burkina Faso, and the other in Pakistan. So we were able to connect with those studies, have them collect breast milk samples and send them here to Manitoba. And then my team has made connections with experts around the world. And so we brought this large team together to then put all that data together and try and understand how's it working together? How is it supporting infant health?

MICHAEL: And you know, in terms of then moving forward and thinking about putting it in, let's step back to putting it in a context, right? I kind of think of this like daycare it hits families for about three or four years and you need it and then you move on, right? And it's the same kind of thing here. So why should the broader public care? Why should non -parents or people who have aged out of being parents care about breast milk?

DR AZAD: Yeah, it's a great question. And you just made the analogy to daycare. And there's a great, I think it's a book or a quote anyway, everything I needed to know I learned in kindergarten, right? So this idea that what you learn early is important for the rest of your life.



And that's true at a biological level too. What happens to us early is gonna affect our health for the rest of our life. And so what do we eat early? Breast milk. And so understanding how breast milk is supporting the immune system, brain development, social development, behavior, even though the breast milk exposure period is only in the first couple months, couple years of life.

The impacts of that are lifelong. So we see, for example, babies who are breastfed early have lower risks of asthma, obesity, diabetes, conditions that can affect us for our whole lives. So from that perspective, it's not just about babies, it's about everyone for their whole lifespan. But also, I mean, that's the primary motivation, but I think there's so much we can learn from breast milk that's applicable outside that sort of infant development sphere. So for example, during the pandemic, there was some really neat research going on about COVID antibodies. So any of us, when we get sick, we get an infection, our immune system is going to produce antibodies. But a new baby has an immature immune system, so it can't produce antibodies in the same way that an older person can. And that's one of the really important things about breast milk. They rely on maternal antibodies that come through breast milk. So there was some research in the pandemic about, okay, after a mother's had COVID or had the vaccine, they're producing antibodies. Could we, from moms who have extra breast milk, extract those antibodies and give them to people who are sick or who are at high risk. So elderly people, for example, in personal care homes. And there's some really neat research going on. Most people are probably more familiar with similar research, but from blood. So taking blood donations from people who'd recovered from COVID, extracting antibodies, which can work, but you can only donate so much blood, right? Whereas if you're a mom who's lactating, you can probably donate liters and liters of milk, potentially.

You know, and there's other research about again related to immunity. So a baby has a very immature immune system. It needs milk. If you think who else has an immature immune system? Well, one creative idea is people who require a bone marrow transplant. Before they can get that transplant, you have to wipe out their immune system so they don't reject the donor blood or the donor marrow. But that comes with its own problems, right? When you wipe out someone's immune system, they're gonna be susceptible to infections and something called graft versus host disease. So there are people looking at, well, could we give breast milk to these people and improve their recovery? And that's looking interesting too. So I think there's many sort of outside of babies, things we can learn from breast milk and apply.

There's also the societal view of it. So instead of thinking about individual babies or individual people with COVID, there's the wider view. So if you're a climate activist or environmental scientist, breastfeeding is more environmentally friendly than the alternative. So if we can support breastfeeding, that's doing something for our planet. And also from an economic perspective, breastfeeding is improving the health of babies, children as they grow older, mothers who lactate have health benefits, so they have lower risk of cancer, cardiovascular disease. So essentially by supporting breastfeeding, we can make the whole population healthier, and that is good for our economy. So there's climate perspectives, economic perspectives, health perspectives, like so many.



MICHAEL: Okay, and you co-direct the Manitoba Interdisciplinary Lactation Centre, which of course has a great acronym, MILC. What's the idea behind the centre and how does it play a role in the much larger international effort?

DR AZAD: Yeah. I'm glad you noticed the acronym, because I think every project, every good project needs a good acronym. So, MILC is really unique. And so, it was conceived and co-founded by myself and my colleague, Dr. Nathan Nicol, who's currently the director at the Manitoba Center for Health Policy. So, we have really different backgrounds, but a common interest in breastfeeding. So, I have a biochemistry and epidemiology background, and Nathan has a background in public health and statistics. And so, we developed this center to bring those, areas together, and there's sort of four components of milk, the first being an infant feeding database. And so in order to keep data on the population and see how we're doing with breastfeeding, we need to have data. And right now there is no collection of data at the population level to know how babies are being fed. So there are good data on, you know, how are babies growing and what are their rates of infections or asthma, but there's not data on how they're being fed.

And also to understand how different policy changes might affect breastfeeding rates, we have to monitor the breastfeeding rates. So part of the center is to capture that data in an easy way and a way that's available for research. And then a second part is the biorepository and that's the area that I run. And so this is where we actually collect breast milk samples from women in Manitoba for research. And it's unique because it's not for a specific research question that we have, it's to build a platform for research. We know there are all sorts of interesting questions about breast milk. So we want to develop sort of a critical mass of samples.

that we can do research on in the future. And then for both of these, the data and the milk samples, they are linked into the Center for Health Policy. And this is a real treasure we have in Manitoba, the Center for Health Policy, where data from the whole population, everyone living in Manitoba, their health records, so whenever they go to a doctor, go to the hospital, get a prescription, that data in a de-identified way is collected at the Center for Health Policy and available for research. There's all sorts of incredible research being done there, but something they've never had access to was data on infant feeding. So now it will be plugged into that. So we can therefore, from the data we collect and the milk samples we collect, we get permission from those participants to link with their admin data. So for a mother who's been born in Manitoba and lived here her whole life and now had a baby, we can collect a breast milk sample for her, analyze it, ask her some questions, and then connect that data into her entire life history of her health. So we can start to ask questions like, well, how was her health in childhood, and is that related to how she's producing milk now?

So looking backwards in that way and also looking forwards for the babies enrolled into this study will keep following them through their administrative data as they grow up. So we can look at this breast milk sample we analyzed today 10 years from now, how is it related to their



health? And so that's really unique in the world. There's no other place that has that ability. So it's going to be a really unique resource for breastfeeding and breast milk research. And then the final part of milk is our milk club. And this is a group that meets monthly and it's growing all the time, but it includes researchers, like myself, the students in my lab, and then healthcare providers. So we have public health nurses, doulas, midwives, doctors attending these meetings, and we all interact on a regular basis. And it's a really good way for us to hear from that community.

What's going on with breastfeeding in Manitoba? What are the struggles you're facing? What do you need to know? How can we help from a research perspective? And then going back, we can say, hey, we found this cool new thing in breast milk. We found this thing about pumping. And they can tell it right to the people, the patients that they're interacting with on a daily basis. So having that kind of direct line of communication is really important for the impact of the research. And so that's what milk is all about.

MICHAEL: OK. So again, there's also social impacts. Who can breastfeed? Who doesn't? Exactly. Are there societal factors?

DR AZAD: Yeah, I had a pediatrics resident in the lab at one point.. She'd just done her rotation in the NICU. So this is where the neonatal intensive care unit, where tiny premature babies are. And she saw that none of them could be breastfeeding at the breast because they were too tiny and fragile. But a lot of them did get their mother's own milk, but fed through a tube or maybe in a little bottle. So she asked me, does that make a difference? And until that point, never crossed my mind. I thought, well, it's their mother's breast milk. same thing. But sure enough, we looked in our data, we had actually asked about pumping and expressing and feeding in a bottle. And together we made some discoveries about the importance of breastfeeding at the breast and how that's different than feeding even breast milk from a bottle, which has led to some really interesting further studies. And it was only because she had that experience and thought to ask the question.

MICHAEL: So it doesn't have the same properties from the breast and the bottle? Something changes?

DR AZAD: Exactly, there are differences. And once you start to think about it, like it makes sense. At the outset, I just thought, well, why would it be different? But if a mom is pumping her milk, she's often putting it in the fridge or sometimes the freezer and feeding it later. So some of the bioactive components in breast milk can degrade through that process. So there are live immune cells from the mother. If you leave the milk out or put it in the fridge or freeze it, those immune cells die off.

So many of the components of breast milk are still there, the nutrients, these oligosaccharides, but some of them are not or they might lose their activity, enzymes could degrade. So there's that component of like, is the milk changing once you pump it and put it in the fridge? There's



also the component of like feeding out the breast involves skin -to -skin contact of the baby and the mother, often eye contact, there's bonding that happens. I'm interested in microbes, so there's also skin microbes that the baby's ingesting as it feeds. None of this happens with bottled breast milk.

Also, the baby kind of learns appetite regulation at the breast, so it just knows to stop feeding when it's full. Whereas if you've put that milk into a bottle, parents are often like, finish this bottle. And so the baby isn't deciding how much it's eating. So that's changing the way it learns its appetite regulation. Yeah, all kinds of things that we're learning. And I always, you know, stop and say, PSA, like pumping is not bad. And I know the effort that moms go to to pump. And sometimes it's the only way they're going to be able to deliver their own milk to their baby if they have to be at work or some babies have problems with latching.

So we're not saying that you shouldn't do it. We recognize that it's really important and we do see in our data it's sort of somewhere in between giving formula and breastfeeding at the breast you have pumped milk. It's got benefits for sure over formula because it's containing all these maternal factors but isn't the same as feeding at the breast. I think that's important to understand not because we want moms to feel guilty but if we learn that it's something about how you store the milk then we can advise moms, okay, make sure that you don't freeze it for too long or you know, you do it this way, or if it's something about the way your bottle feeding and so on.

MICHAEL: I heard you give a lecture, and back to a point you made, and you talked even about the different qualities of breast milk in the morning if you feed in the afternoon, and also about...

the fat content and how that helped the child be able to feel like they were full and regulate. Can you tell us a little bit more about that?

DR AZAD: Yeah, so breast milk is dynamic, meaning that it changes. And so it changes in several ways, one being longitudinally over time. So the milk that a newborn baby needs is different from the milk that a five or six month old baby needs because it's growing and its needs are changing. And so breast milk changes along with the baby to match those needs, which is really neat.

And then also from within one day, there's a sort of diurnal cycle or circadian rhythm to the milk. So the milk produced in the morning is slightly different from the milk produced at night. The levels of different hormones are changing. The nighttime milk helps the baby sleep a little better. So this is one of the ways that the baby develops its own circadian rhythm. And then as you said, even in one feeding, so from the beginning to the end of a single feeding session, milk is changing. So the fat content goes up towards the end which we think signals to the baby that sort of this is dessert, your meal is over and it learns to regulate its appetite in that way.

And so those are all things that you can imagine are not replicated in a formula, which is kind of



one size fits all, but also not even replicated if you're pumping milk. Because you're, and you could though, so if we learn more about this, you know, you might be careful to not keep your milk in the freezer for six months because now it's no longer optimal for your six month old baby if you pumped it six months ago.

And even, you know, if we find the morning -night thing to be real important, then moms who pump might want to keep their morning milk separate and their night milk separate. So these are all things that we're still learning about, but that really point at the incredible uniqueness of breast milk and the way it's produced and fed to babies.

MICHAEL: And I find that fascinating, right? Because I, you know, I don't think that's how we, you know, people have kind of thought about breast milk and how complex it is. What have we found about how it's impacted, or lowered rates of asthma and allergies and obesity? What's the connection there? I mean, you talked a little bit about obesity because the baby's learning how to regulate how it eats, right? But what's the connection?

DR AZAD: Yeah, so we see in our epidemiologic research, so leaving the milk samples aside, but just looking at the connections of different feeding patterns and exposures in babies.

linking that to their later rates of disease. We see, for example, that babies who are breastfed have lower rates of obesity as one example later on. And we think there are a variety of mechanisms through which that happens. So one being this appetite regulation, but another being the components of the milk itself and the amount of energy and the way it's metabolized by the baby early on can affect its body composition.

So an example being cow's milk, which is the basis of formula, has a higher protein content than human milk would. And that sort of makes sense. Like a baby cow needs to build its muscles. It's up, running around. Whereas a human baby is kind of sleeping and really devoting its energy to brain development. So it's lower in protein, higher in fat. So if you feed cow milk to a human baby, that's a bit of a mismatch. And the baby's going to grow bigger, faster. And so as we learn more about this, formula compositions are being adapted, but that's one example. Also, I've mentioned the microbiome. These are the bacteria living in and on our bodies. And this is really how I got interested in breast milk in the first place, was because I'd been studying the microbiome of babies and looking at, you know, it's very different in different babies. What drives those differences? And we found two main answers. One is how the baby is born, whether vaginally or by a C -section, because that's where it gets first exposed to bacteria. But the second being how it's fed, whether it's formula or breast milk.

And so seeing that deep connection that breast milk is changing these gut bacteria made me interested in studying it. And it also, I think, explains the link to a lot of different health outcomes because these gut bacteria are important in so many ways. They're important throughout our lifespan, but that first gut bacteria community gets established very early in life. And so these bacteria are doing things like extracting energy from the food that we eat. So the food we eat is



also food for our microbes and two people eating the exact same food might actually extract different amounts of calories from that food based on their gut bacteria. Because the gut bacteria help you extract and digest food that you actually can't digest on your own. And so the gut bacteria are related to obesity phenotypes. And if breastfeeding is shaping the gut bacteria, then that's a way of it being connected to obesity. And the same thing for asthma. So in addition to extracting energy from food, these gut bacteria help train the immune system early in life. So they help educate your body and your immune system.

You know, what's a problem, what's a pathogenic bacteria that you better get rid of and react to and cause inflammation versus what's like a harmless exposure. So conditions like food allergies and asthma are problems of the immune system. And so if you don't have the right gut bacteria early in life, you can end up with immune system problems. And then again, if you don't have breastfeeding, you might not be shaping the right gut microbiome community. So these are some of the ways in which...breastfeeding is linked to these later health outcomes is through the gut microbiome, through the immune factors that are actually present in the milk, and through those other mechanisms like appetite regulation. In the case of asthma, we also think that suckling at the breast is sort of exercise for the little baby lungs. So if a baby is fed by a bottle, it doesn't have to have that suction exercise, and the lungs don't develop as strongly. So there's many possible ways.

Music transition

MICHAEL: Is it true that a mother can read the baby's saliva and adjust nutrients to meet the baby's needs?

DR AZAD: Yeah, so this is something fascinating about breast milk and breastfeeding. And I'll be honest, we're still learning about this. But yeah, there is evidence that this is one of the ways by which the mom changes her breast milk composition to match what the baby needs, because you have to have that communication from the baby. So during breastfeeding, there's a little bit of backwash, you could say, from the baby's saliva through the nipple. And if the baby, for example, has an infection, it's the baby's way of signaling that to the mom so that she can adjust the composition of the breast milk, produce the right antibodies.

So it's something we're still learning about, but it's another one of those aspects of breastfeeding that you could never replicate in a substitute.

MICHAEL: when I heard you present, I mean, you have this very powerful chart where you present all the qualities of breast milk versus formula. And it's considerably longer with breast milk, a lot of which you've discovered through your research. And I guess people would wonder, why can't we copy that in formula? Now that we know all the qualities or more of the qualities of breast milk. Can we evolve formula so that it does have, it is more effective? So maybe we'd have a formula that you'd give in the morning and one at lunch and one in the evening. What are the challenges?



DR AZAD: Yeah, so it's a great question. And I will say, like, over time, the more we have learned about breast milk, the more the formulas have evolved and, I would say, improved over time to become closer to breast milk. So that's definitely happening. Formula companies are all over that. But it's kind of...

like a mission impossible because there isn't just one breast milk formula that we have to figure out and then copy, right? As I've explained, it's changing over time, it's changing from morning to night, it's changing within one feeding, and even if as you say, well, let's make a formula for every month, like maybe we could do that. But even then, like what I haven't mentioned yet is that it's different between each mom. So it's not that every mom is making this same breast milk at one month and then two months and morning and night and we just have to figure it out.

It's really different. So the same two moms feeding in the morning like will make still different milk and that's for many reasons one of them being genetics so many of the components in breast milk their Production is regulated by the genetics of that mom And that's very different between individuals. It's also affected by the environment So what might be like the best optimal milk for a baby living here in Winnipeg in winter right now? Might not be the best optimal milk for a baby living in Tanzania

where it's super hot and it's the middle of a drought. And so it's individualized to the environment and to the genetics and thinking more about the microbial environment too. So if a mom, we talked about COVID earlier, if a mom has COVID, she's gonna make those antibodies, likely her baby has also been exposed to COVID, so it's gonna get that protection. So those individualized and sort of like timing specific components of milk can never be replicated in a formula.

So I think the, you know, the optimal is to promote breastfeeding, but we can always try and improve the alternatives.

MICHAEL: And obviously, for some breastfeeding isn't possible. Right. And so how do you feel your work can help inform or help those families?

DR AZAD: So one way is,, by learning more about breast milk, we can improve the alternatives.

I think also by learning more about breast milk and providing solid evidence of its benefits, we can take that to policymakers and say, look, this breast milk is really important. Here's all the things it does. We want you to improve maternity leave practices. We want you to put lactation rooms in all workplaces and public spaces because it's important that moms have a place to breastfeed or to pump their milk. We also can then approach funders and say, look how important this is.

We need more money for research on breastfeeding. So there's many angles that this work can help, not only babies who are breastfeeding, but other babies as well.



MICHAEL: Right, and situating it in how valuable and important it is. I mean, there is a whole policy issue. And I'm sure as we find with other health outcomes,

correlated to income, higher your income, higher probability you'll be in a situation where you'll be able to breastfeed.

DR AZAD: Yeah, yeah, that's true here. It's interesting though, it's not true all over the world. There are some countries where there's a perception that, well if you can afford formula, you must be rich. So having formula is like a status symbol. And so there's a lot of work to be done in those settings to kind of re-educate the population and say, no, actually your breast milk is really valuable, that's the best thing for your baby if you can provide it.

And so the social patterning we call that of breastfeeding is different in different parts of the world.

MICHAEL: So for those parents or caregivers who are making decisions about infant nutrition, what do you want them to know? And how does our early nutrition impact our future health?

DR AZAD: So I think first I want them to know just how incredible breast milk is.

Every parent should make their own decision that's best for their family, but it should be an informed decision. So I want them to know at the outset that there's all these amazing things about breast milk. It's kind of a superpower to be able to produce it. And so parents should know that. So even if you're not a parent, just knowing that that's the normal way that babies eat will encourage us to not look weirdly at a woman who's breastfeeding in the park.

That can be a problem for some parents. But I also want them to know, you know, every drop counts. So I think if some parents either for, you know, reasons related to their work or their family or their lifestyle think, you know, I'm never going to be able to reach that recommended six months exclusive breastfeeding. So, you know, why bother? I'll just do formula. What I want them to know is like, you can do partial breastfeeding and that's still really beneficial. Our data show that.

Even, you know, one month of breastfeeding has benefits if you can't go the six months. Even honestly, one or two days of breastfeeding is important and our data show that. So that first milk is called colostrum. It's super high in concentration of antibodies and other growth factors that babies need. So just any bit helps and our data strongly show that. So I absolutely support the recommendations of six months exclusive breastfeeding and continue to two years and beyond, but it's not that you have to attain that to get benefits. So I think that's important for parents to know and for everyone to know.

The other thing parents should know is that support is available. So I think sometimes the message about breastfeeding gets misunderstood as it's natural, so it's automatic. And it is



natural, but it is not automatic. It's something that the mother and the baby both have to learn. And sometimes there's difficulty with that at first. And I think if parents go in with the idea that this is just going to be easy and automatic and it didn't work, OK, I give up. Rather than if they knew, oh, it might be challenging at first, then they know to keep trying. And also they know where to go for help. So we have lactation consultants, we public health nurses, midwives, we have community support groups, so having parents know about that before they try and knowing where they can go to help is get help is really important.

MICHAEL: Interesting, very interesting. So one final question, and it's kind of looking forward now. You've been doing your research. What excites you? What gets you up in the morning? And what questions are you still trying to answer and uncover that you think are really important?

DR AZAD: So many. I mean, we could do a whole other podcast on that. But. You know, I'm excited about this IMIC consortium that we talked about, the machine learning, the milk as a system, because we're at the stage of that project where we've generated all the data and we're now sort of crunching it, integrating it, seeing what we'll find. And you know, I think we'll find lots of things. I think we'll likely discover new components of breast milk that we didn't even know existed before, I think we're gonna learn about how the different components interact, how that affects infant health. and I think understand a lot more too about what's different, what's normal, what's optimal in different settings because so much of the breast milk research that's been done, which is not enough research period, but of that research, most of it's been done in high income settings. Canada, US, Europe, very little has been done in places like Tanzania, Burkina Faso, and Pakistan. So I think we're gonna learn a lot about just how is it similar or how is it different. So I'm excited about the results of that study that are coming up.

And then donor milk is something we haven't mentioned yet, but for babies whose mothers aren't producing milk but want to still feed human breast milk, we have donor milk banks. And right now they're kind of limited in their distribution to premature babies who need it the most. And that's the right priority. But going forward, could we expand that? Could we offer it to other babies in the community? Because we do have to make sure it's safe. So a certain amount of processing has to happen. but at the same time we want to preserve that bioactivity and so there's a lot to learn there. So that's a really interesting area of research.

MICHAEL: Well, Dr. Azad, thank you so much for a fascinating conversation.

I hope our listeners now understand why I talk about you a lot. Your passion for your work, but also the complexity of it and the new things that you've been able to learn and teach us, I think are really valuable. I think it's brought a whole different level of interest and understanding of breast milk and its impact. So thank you so much for taking the time.

DR AZAD: Yeah, my absolute pleasure. I always love talking about this research and the team of people behind it. Thank you.



OUTRO MUSIC FADES IN

MICHAEL: Thank you so much for listening to another episode of “What’s the Big Idea”. If you enjoyed our conversation, share it with a friend and make sure to subscribe, rate and review the series.

MUSIC SWELLS

Join us next time as I sit down with Dr. Julianne Stroeve. She is a Canada 150 research chair at the University of Manitoba and a global expert on sea ice and climate change. She has briefed many on her research, including U.S. congressional staff, former Vice President Al Gore, and the World Economic Forum.

She will tell us the real story of climate change. In her expertise, events are going to unfold differently than many people assume Canada will be a very different place, for better and worse. That's next time on What's the Big Idea?

For more information about the University of Manitoba and our global impact, visit umanitoba.ca. See you next time.