Handpicked: Stories from the Field

Season 2, Episode 2: “Disadvantaged by Digitization”: Technology, Big Data, and Food Systems

Featuring Harrison Runtz in conversation with Kelly Bronson, Irena Knezevic, and Carly Livingstone

# **Transcript**

## **Speakers**

Amanda Di Battista: **AD**  
Laine Young: **LY**  
Harrison Runtz: **HR**  
Kelly Bronson: **KB**  
Carly Livingstone: **CL**  
Irena Knezevic: **IK**

{[Tractor Sounds]}

**AD**: Have you ever thought about the relationship between food and technology?

We all know that changing technologies have impacted the way we produce and get food—from the ancient introduction of tools that enabled new ways to grow food, to more recent examples of technological innovation like vertical farming, or online food marketplaces.

But the relationships among food producers, technology companies, big data, and consumers, are incredibly complex. Those relationships also have the potential to be very profitable, with big-tech companies holding the biggest share, and the most power.

On this episode of *Handpicked*, we’ll start to untangle those relationships and examine how power, big data, and visions of a technological future of farming, are impacting our food systems.

{[Opening Music]}

**LY**: Hello and thank you for tuning in to this episode of *Handpicked: Stories from the Field,* a podcast from the Laurier Centre for Sustainable Food Systems. I’m Laine Young ...

**AD**: And I’m Amanda Di Battista. We’re super excited to bring you a special episode exploring technology and agriculture, co-hosted by Harrison Runtz. Harrison is a Strategic Communicator and recent grad from the Masters in Communication and Media Studies at Carleton University, in Ottawa.

**LY**: Harrison talked with sustainable food system experts: Kelly Bronson, Carly Livingstone, and Irena Knezevic about how big agribusiness and tech giants are changing how we grow and get food. They’ll tell us why we need to look closely at the way corporations exert control over agricultural and consumer data and critique the vision of technological innovation as the only way forward.

**AD**: We’ll get to those conversations in just a minute, but first, I sat down with Harrison and asked him to set the stage for us.

**LY**: Great, let’s hear it!

{[Short Music]}

**AD**: Hey Harrison, how’s it going?

**HR**: Hi Amanda, I’m doing well. Thanks for having me on the podcast.

**AD**: Well, thanks for being here. So, you’re going to walk us through why it’s important that we think critically about the impact of new technologies on food production and distribution, right?

**HR**: Yeah, I am. We all know that the way we get food is changing. This past year I think a lot of us have definitely gotten more familiar with online grocery shopping. It’s no longer a novelty. You'll be hard pressed to find people who haven’t used *Instacart*, *Click and Collect*, other online grocery services, during the pandemic in major city centres.

**AD**: Interesting, so tell us what you’re going to talk about today.

**HR**: Well, I talked to food studies scholars: Kelly Bronson, Carly Livingstone, and Irena Knezevic about how big agribusinesses are using emergent technologies and big data to change the ways that we grow, shop for, and consume our food.

We’ll also talk a little bit about how the future of food production and consumption is being imagined in a very technology-oriented way. And about the forces that are driving that particular vision of food production and technology as the way forward.

**AD**: Awesome, let’s get started.

{[Short Music]}

**HR**: First, I talked to Kelly Bronson.

**KB**: Hi, I’m Kelly Bronson, I hold a Canada Research Chair position, the title of which is ‘Science and Society’ at the University of Ottawa. You know, I’m really interested in fostering good relations between publics and technologies, but it means I often focus on controversial technologies or we might call them moments of breakdown in that relationship, trying to figure out kind of what went wrong, and what can be done better next time.

**HR**: Kelly studies emergent technologies.

**AD**: Like big data and artificial intelligence?

**HR**: Yeah, exactly! And how those technologies are impacting everyday people.

Kelly focusses on the conflicts and controversies that affect the relationship between the public and producers, like small-scale farmers and merchants. She’s really interested in how technological advancements, things like pipeline technologies, big energy development, environmental assessment, data processes and decisions, how those are impacting these relationships.

I asked Kelly to shed light on how new technologies are involved in the food sector and in agriculture. I wanted to learn more on the positive impacts of digitization. Here’s what she said:

**KB:** Yeah, sure. So, you know, when people think about digitalization, I think we often imagine or it's easier for us to imagine digitalization of labor, but people don't often think about agriculture. So, I happen to study this really interesting set of emergent technologies, you know, big data sets and data analytics, or the use of sophisticated computing to make sense of large volumes of data, and even computer programs that learn on their own, or what we might call, you know, “machine learning” or “artificial intelligence” (AI). So, these really emergent, kind of, you know, at the vanguard, or the forefront of innovation technologies, applied to a sector a lot of people think is kind of parochial and folksy and something of the past, which is food production.

**AD**: Okay, that sounds interesting, but what do big data, AI, or machine learning have to do with farming?

**HR**: Yeah, they definitely seem like disparate worlds. So, I asked Kelly for an example of how emergent technologies are impacting the way that some people farm, and here’s what she told me:

**KB**: Just to give you an example, if you buy a new big green tractor from John Deere Corporation, the tractors are very expensive, so it will probably cost you over half a million dollars, but that tractor also comes embedded with hundreds of sensors. Sophisticated sensors that not only sort of manipulate the machine as it works through the field, but also collect data on the field, on the soil, on the status of the equipment itself, even how the equipment is being used and by whom. And then those data are brought together with remote sensing data from satellite constellations, say, from NASA. And then those data are brought together in cloud-based systems. And then it's often or it's increasingly the case that computer programs or what are called “decision-support platforms,” are used to mine those data and then give the farmer what is thought to be insights on their farm. So, you know, parts of their farm field that are underperforming, or, and need therefore attention, say, in the form of extra chemical fertilizer, or, you know, advice on maybe when is the best time to harvest one's crop. And so, all of that together, the sensing technology, the, you know, computer, sophisticated computing technologies, it's being referred to as "smart farming" by some people, or "digital farming," or even by others, "farm 4.0."

**AD**: Wow, okay. So, concepts like “smart agriculture” or “digital farming,” use local and remote sensors to collect all sorts of information about what’s happening on farms?

**HR**: Yes, but it goes even further and runs that information through sophisticated programming to help farmers make decisions about how best to proceed.

**AD**: Hm, that sounds incredible, but what’s the catch?

**HR**: Yeah, it’s funny that you ask that, because while all this technology sounded really positive, I did get the sense that Kelly had some reservations about this approach to farming.

I asked her if she thinks the digitalization of agriculture is a good thing, or if there are other impacts that we should really be paying attention to. She started by telling me about some of the potential benefits:

**KB**: I think there's a lot of hope that these technologies will lead to a number of different gains. So, you know, some proponents of the technologies suggest that, for example, automatic milking machines for cows, so robots milking cows, can help in the reduction of what is really quite backbreaking labor. I don't know if you've ever milked a cow, but these technologies are also spoken of as kind of animal welfare technologies for a host of reasons that they can do things better vis a vis animal ethics and welfare. There is, you know, the kind of lifestyle argument which is what I just described that, you know, if you're a farmer and you can leave your tractor to farm the field all on its own, right, then you can do other things, and you then have more leisure time. And the hope is that using a machine intelligence or an artificial intelligence, mining a huge data set collected across thousands of farms, could lead to more precise recommendations about how to use harmful inputs, farm inputs like chemicals, but also scarce inputs like water.

There's also a big thing, especially around robotics, as a particular set of digital technologies. One of the arguments is that, it helps with a labor shortage. So, one thing that's happened and become more clear under COVID-19 actually, is that less and less people are willing to work the lowest paying jobs in farming. And so, if you're especially a soft fruit grower, when it's time to pick fruit right off the trees or from the field, you often have to rely on temporary laborers. And those are, in Canada, temporary foreign workers who can't always cross borders, for example, during a global pandemic. So, there's a real labor shortage and labor vulnerabilities that automation, I think, proposes one solution to that problem, if you will.

**AD**: Okay, I can see how cow-milking robots or fruit pickers, or more information about environmental impacts are good things.

**HR**: Yeah, for sure. There’s no question that technology has the potential to be highly useful for farmers. But Kelly does have some serious concerns about the kinds of big agribusinesses that are forming around these things. Large corporate entities that have a lot of stake in collecting and controlling data from these food producers, from farms. Take a listen:

**KB**: And so, you know, I think one of the sort of clear potential issues around digital agriculture is this potential for the reproduction of power among the already powerful, particularly among agribusinesses. So, we know that John Deere, through licensing agreements, shares data collected using their tractors, or by their tractors, passively with companies like Monsanto. And the question is, what are those companies doing with those data? Given what we know is done with, say, social media data and the money that are made from the collection of personal data, what can we infer that companies are doing - - going to do with agricultural data? And so, my big concern is about, again, that these data that are collected by farmers won't be as useful to farmers as they are to large businesses, which will use them to just further concentrate power, right? They might anticipate, given a particular season and the weather in that season, that farmers, especially in a particular region, might need more of chemical X and they'll set prices for those chemicals, or they know that farmers have done quite well in a particular commodity one year, and they'll set prices to capture any gains the farmers otherwise might have seen. And, you know, digital technologies, therefore, if they have the potential, and I think they do, to reproduce power among these already powerful actors, it has all sorts of implications for real people in their lives.

**AD**: Oh wow, so being able to collect and access tons of data from farms is really in the best interest of big agribusiness—it sounds like it’s potentially very profitable.

**HR**: Yeah, it definitely is, and Kelly told me that there are other issues as well—the data being collected by large corporations isn’t accessible to farmers, even though it is information about their own farms.

Farmers also aren’t able to repair tractors or farm equipment that we’re talking about here because they really aren't just machines, they’re also digital technologies protected by copyright legislation. As you can imagine, all of this results in a real lack of trust among farmers for both agribusinesses, and the governance systems that protect technology.

I asked Kelly to tell me a little bit more about how these corporations use technology to consolidate power, and what that means for farmers. Here’s what she said:

**KB**: Yeah, I have a book that hopefully will come out in 2021 with McGill Queens, and part of the, I would say my main goal with that book, is really to get people to read companies like John Deere and Monsanto as Facebooks. We also don't think of businesses like John Deere as tech giants, right? There's now quite a lot of political will or a critical kind of political attention to the uses and misuses of social media data. If you think even the changed behavior of Facebook during this last American election, right?

And companies like Monsanto and John Deere are doing the exact same thing. They're harvesting data collected by farmers, or by their farm equipment passively, and, and who knows what they're doing with it? Not only is there potential for them to misuse it, in the ways that I described before, potentially using it to know things about farms or particular farm regions that allow them to maximize profits at the farmers expense by, for example, setting prices for farm inputs. But also, beyond the misuse, there's also this problem with, I think, which I think is an inherent ethical problem or issue, which is that, there is arguably an incommensurate gain, right?

If you look at the history of seed science in Canada, there was a slow privatization of seed science and seed laboratories where companies, like chemical companies like Monsanto, bought up the seed research and privatized it. So, it was no longer something open, you know, and the products of the seed research over time, and if we look at genetically modified organisms as sort of the case in point, they became privatized and protected by really stringent or narrow property legislation. Such that, you know, these seeds don't just circulate, farmers can't save the seed, they can't improve on the seed like we've done since the beginning of agricultural domestication of plants. And that has all sorts of sociological and environmental effects.

And so, Monsanto, you know, that kind of legacy of the privatization of research, the concentration of power, those two things go hand in hand. And I think we're really seeing that legacy then play out with the digitalization of agriculture or there's certainly the potential for it, because, you know, the power of these corporations meant that early on, for example, these corporations could establish relationships with manufacturers, so Monsanto I'm talking about, right? They could establish a relationship with John Deere, which dominated the sector and so, these big, powerful companies that had historic relationships with farmers, that had, could wield their sort of level or inequitable market power in the food system, could - - have used that advantage to collect the data, have used that advantage to share data among these companies, and have used that advantage to develop intelligent machines or what they're called in farming is "decision support systems." And so that historic advantage is just becoming exaggerated, I think, under digitalization. You know, power begets power, money begets money.

{[Short Music]}

**AD**: Oh wow, we’re so familiar with the issues of privatization, data mining, and privacy when it comes to a company like Facebook, but I hadn’t thought about it before in the context of our food system.

**HR**: Yeah, I think those examples are really helpful for understanding why it’s important that we think critically about any technology that collects data. Clearly, it’s so important for farmers to have access and control over the data they are helping collect.

Given all of the positive potential in agricultural technology, I wanted to know if there was a better way forward. So, I asked Kelly if there are any initiatives that take a different approach to this relationship between technology and agricultural production?

**KB**: So, I'm concerned not just about inequitable power between farmers and agribusinesses, but also power inequity among farmers and in particular between large scale, what we call in Canada, "incorporated farms” and the “smaller scale diverse farms." And small, diverse farms are really important for resilience in the food system and beyond. And we really see that they're also disadvantaged, and by digitalization.

I do think these tools could be used by a variety of farmers. But currently, the big corporations like the John Deeres, like Monsanto, they're not designing these tools for the smaller, right, diverse farms. Again, because those aren't the farms that have the money to pay for the newest and biggest technologies.

But there’re other, you know, just sort of to speak in more concrete terms, there are groups of farmers who are on, - - and by concrete, I mean like, who are working on this as a material problem and workshopping the design of affordable tools for diverse farms. And so, there are groups of volunteer farm, farmers, who do this in their off-time, as if farmers have any off-time. But, so, one group is called the Gathering for Open Agricultural Technologies, or GOAT, which is a cute acronym. And they meet online and they have all sorts of mechanical tools that they developed kind of hacked versions of or do it yourself versions of, and they have a wiki tool list and instructions and they host workshops. And then I, you know, I have some projects too on the go with colleagues, where, where we're trying to work with what I would say are the still small voices or the kind of, those who are potentially being left out or not in a position of power to access the tools, or to use them, and we're trying to work with them to, at least in terms of, just to conceptualize what data sets are needed, right? What sensors might be needed to collect those data? What would an ethical fruit-picking robot look like?

**AD**: Hacktivist farmers, amazing! It’s incredible to hear that farmers, especially smaller scale farmers, are finding ways to harness some of the really significant potential of technology, and to push back against a system that often leaves them out.

**HR**: Yeah, it was really interesting. It’s definitely thought-provoking and makes me think about how important it is to remember that the technologies themselves hold all sorts of potential for farmers and food producers. The question it comes down to is really who controls agricultural technologies, and how can we ensure farmers’ interests, data and livelihoods are being protected.

{[Music Break]}

**AD**: Okay Harrison, we’ve talked a little bit about farming technology—what are we talking about next?

**HR**: So, I thought we’d spend some time looking at the broader impact of technology on food systems. To get some insight into the ways that technology is changing how we get food to our plates, I spoke with Carly Livingstone, an expert in communications studies and data science, and Dr. Irena Knezevic, a food systems scholar and professor. I’ll let them introduce themselves:

**CL**: So, my name is Carly Livingstone. For the past few years, I've worked in two different roles that have centered around food systems, innovation, and smart cities.

**IK**: So, my name is Irena Knezevic, and I'm an associate professor at Carleton University in the School of Journalism and Communication. And I have been working on questions of food systems and various approaches that we have to understanding how we produce, distribute, and consume food. I've been working in that area for about 15 years now.

**HR**: Irena and Carly recently wrote a paper focusing on how big tech has become major player in food retail spaces, and what it means for our food system. They focused on Amazon and argue that Amazon’s retail tactics—their drive to be a one-stop-shop for everything—puts them in a position to be a key broker of global consumer data, which is very profitable.

{[John Deere Ad Plays in Background]}

Irena started by explaining how agribusiness tries to imagine technology as the only future for farming and pointed to a series of video ads that John Deere has released over the last 8 years as a really interesting example.

In this ad we see a farmer starting his day in a quiet house. Coffee in hand, he walks to an interactive pad, logs in using a touch screen, and accesses all the information about his farm. Farming operations start at his desk, where he controls all aspects of the farm, his irrigation systems, communications, and harvesting programs. All are done through here.

We then see another farmer in a field using a smart tractor. He orders maintenance with the touch of a button. In real time, he tracks the maintenance crew coming to him. Another farmer examines the health of a plant using a smart phone app.

The ad really tries to paint a picture of a farm that uses technology across all parts of food production. It’s a comprehensive view of tech companies’ idea of how technology streamlines production, and increases efficiency to improve crop yields and farmers lives. In their own words, John Deere presents, quote, “a vision of how technology could drive the increased productivity necessary to feed a growing population,” end quote. And here’s Irena with more.

{[John Deere Ad Music Ends]}

**IK**: So, the argument that John Deere presents in these videos is that this futuristic vision of farms, which in many ways resembles science fiction, a futurism perspective you see in things like *Star Trek*, for example, that this will be the way that farms will operate in the future and that they will offer us more precision, that they will be safer and more predictable for farmers, offer them more income, et cetera, et cetera.

And so, what those videos are really suggesting, and what I think companies like John Deere have been promoting, is the notion that old-fashioned farming, so farming that doesn't entail digital technologies, is somehow outdated, inefficient, problematic, and would not offer a good life for farmers themselves, but also would probably not deliver as much food as we might need in the future with the growing global population.

**AD**: Irena sounds pretty skeptical about that vision of the future of farming.

**HR**: Yeah, she certainly did! So, I asked her why she felt like this technological farm forward future was out of sync with the realities of farming.

**IK**: What you see in that is a really sort of significant scale of use of technology, the kind of technological investment that would be impossible and completely out of reach for most of the farmers on the planet. Even in economically advanced countries like Canada, most farmers would never be able to afford those kinds of technological structures for their farms.

There are also technologies that are really designed for large scale farming. So, I mean hundreds, if not thousands of acres of typically one crop, because if you have multiple crops in one field, these technologies are really not adaptable to something like that.

So, my skepticism comes from this critique that I have of their vision that this is 'farm future,' as if all farms will look like this in the future. But in reality, that would only be a possibility for a small number of farms that operate in very particular ways of this industrial food production. And what I mean by industrial food production is that production of single crops on large swaths of land. Now, that kind of production is problematic because it has, over and over, been demonstrated through multiple scientific studies to deplete biodiversity, to deplete soil quality, to create a lot of problems around water and air pollution.

Now, for most farmers, there's significant barriers to entry. And those barriers to entry are, first of all, economic, because you have to invest in this kind of technology. But they also have to do with technological literacy, because you have to be technologically literate to be able to operate this kind of machinery and software that's involved and navigate between different data platforms that are involved. And so, it presents a challenge to farmers who don't have the money to get into this market, who are not technologically literate. But it also presents barriers to farmers who are interested in farming in ecologically sound ways, and want to, for example, grow multiple crops in the same swath of land to ensure that biodiversity and soil quality are maintained on their land.

**AD**: So, what I’m hearing from Irena is that the picture of agriculture in the future as painted by John Deere and other big players in agribusiness actually excludes a ton of farmers for a bunch of reasons.

**HR**: Right. All but the biggest farmers engaged in industrial scale agriculture are left of out this vision. It’s just too costly, it requires too much land and too much technological knowledge, and it really relies on farming practices that are pretty ecologically destructive.

Irena told me that as much as 70% of all the food produced and consumed in the world is produced by small and subsistence farmers.

**AD**: So, when John Deere and other big businesses talk about supporting farms with digital technologies, they’re only talking about supporting a very small number of farms producing a relatively small proportion of the food that is being consumed on the planet?

**HR**: Yeah, exactly.

**AD**: But can’t technology help farmers better control things like water usage?

**HR**: Yeah, I asked Irena exactly that question. And here’s what she said.

**IK**: There's a couple of concerns we have about that. One is that the way these technologies are presented is that they're framed as precision agriculture. And this notion of precision really suggests some sort of predictability in farming. And as we know, nature is not all that predictable. So, in some ways, it's a misleading way of imagining farming of the future. But a bigger problem we have is not the collection of data and the kind of knowledge that can be derived from that data, but who actually gets to own that data? Who gets to use it, sell it, or exchange it with other companies, what kind of decisions they get to make with that? And in turn, who benefits from those technologies more? Is it the companies like John Deere, or is it the farmers themselves?

**AD**: It sounds like Irena has many of the same concerns about the collection and use of farm data that Kelly told you about earlier.

**HR**: Yeah, she sure does. While Irena is also really critical about the scale and type of farming that agricultural technologies tend to support, she told me that there are folks out there who are using technology to enhance farming in other interesting ways. Here she is again:

**IK**: Alternatives, however, do exist. And I think this is important to note, because there is no argument, I think, that we need to harness these technologies and make people's lives easier, especially farmers' lives. There are initiatives where alternative, technologically-skilled folks have been trying to - - create technologies and digital platforms that are, in fact, helpful to farmers. So, *Farm Hack*, for example, is an organization that has been trying to develop different software that farmers can use if they are interested in trying precision agriculture, but is open-source software, is repairable, adaptable, and is not made for profit.

**AD**: So, it sounds like the take-home message is that agricultural technology isn’t inherently bad, but we need to be really aware of who holds the most power and how they’re using technology and data to impact the food system.

**HR**: Yes, definitely. *Farm Hack* is just one example of the many organizations that imagine and use agricultural tech differently all along the food chain. What these alternative initiatives have in common though, is a focus on open-source software, and technological solutions that prioritize farmer livelihoods and sustainable food systems.

{[Music Break]}

**AD**: Okay, so we’ve heard about the relationship between emergent technologies and data mining in agriculture from Kelly Bronson.

**HR**: Yeah.

**AD**: And we heard about how technologies can impact how we imagine the future of farming, and who is included or excluded from that vision, from Irena Knezevic.

**HR**: Yeah, for sure.

**AD**: What are we talking about now?

**HR**: I talked to Carly Livingstone about digital technologies in food retail, focusing specifically on Amazon. In 2017, Amazon made headlines when it purchased Whole Foods, the high-end American grocery chain for more than $13 billion US dollars. However, Carly told me that Amazon’s entry into the food retailing space goes much further back than 2017. Here’s Carly with more:

**CL**: Amazon's goal is to become a one stop shop for all consumer goods for as many customers as possible. Food is just one more frontier that it needs to cross to get more customers. And more than any other retail industry, food has the most customers.

None of it is hidden if you go back and you look at, um, at Amazon Press releases and what's come out in the media since Amazon came into being in the late 90s and, you know, it's all there. But it wasn't really until 2017 when they purchased Whole Foods that all of a sudden it was like food retailers took note. And all of a sudden it was really on the map. But, you know, in 1999, Amazon acquired I think it was a 35% stake in this website called 'HomeGrocer.com,' which was the first online, online grocery and delivery platform. So, that was 1999. And between 1999 and 2017, there's been these things like they announced an alliance with a UK retailer, Marks & Spencer, which owned the US supermarket group Kings. And in 2006, they launched Amazon Fresh, which was delivery on dry groceries. You've got Amazon Prime with 1 hour delivery of fresh produce in 2014. And then, and then you see a lot of this just expanding out to more and more cities as well. And that, and that's really just up until 2017, and it's been post-2017 since we've seen like the Amazon ghost stores, which, you know, are cashier-less and you see more of the technology that's kind of in your face where it wasn't before.

**HR**: So, if there's one thing, we, we've all kind of seen during COVID especially, is that, this, there's clearly consumer preference for having goods and services delivered at a distance. So, Amazon’s tapping into these consumer preferences for convenience of staying at home and for low costs. So that's not something that we should be celebrating? Is that not market solutions to these things? Is there a concern here that that kind of thought might be missing?

**CL**: Yeah, I mean, I'm definitely not going to sit here and tell you that convenience and low cost are bad in and of themselves. When it comes to food, I guess the question is, are costs and convenience all that there is? And as eaters, what's the role that we want to play in shaping our food system? And when it comes to Amazon, our concern is, you know, are they impacting our right and our ability to exercise our right to shape food systems that are actually, you know, for the environment and for people not just as eaters, but the people who grow the food and everyone who works in the food system in between. Amazon's really tapped into, and is able to give us what we want and what we need, and it does that by mining our data and the data of other food retailers. And in doing so, it makes itself the obvious choice for us.

The reason that many of us turned to Amazon during the pandemic is because Amazon was ready to deliver and to provide this service. Amazon's online grocery sales tripled in the second quarter of this year and they boosted their grocery delivery capacity by 160%. So, you know, Amazon is starting to shape what we want and what we can expect from our food retailers. And they're using our data to do it. But I think one of the things to think about is that it's occurring at the expense of (a), our privacy, (b), traditional and smaller, smaller and larger retailers who, who can't keep up, or who now can't really enter into the food retail space, and then, (c), I think it comes at the expense of local food systems, which especially, you know, what has been really evident during COVID is, they're really critical to community resilience.

I think it's important to note that I don't think it's something that should fall strictly to consumers. You know, things like policy, funding and support for local food infrastructure, regulation, anti-poverty measures like these are all really critical components to us as eaters being able to even make the choice to forego your discount on Amazon for a local farmer's market or a CSA share. And at the end of the day, too many people are living with food insecurity that doesn't afford them the privilege of choice. But we also know that food insecurity isn't a cost of food problem, it's an income problem. But Amazon really taps into that low-cost aspect of consumer welfare.

{[Music Break]}

**AD**: It sounds like Carly has identified three consequences of Amazon’s growing presence in online food retailing:

1. The impact on privacy
2. Adverse effects on small-scale retailers who can’t keep up with Amazon’s model, and
3. Impacts on local food systems.

**HR**: Yeah exactly, Amanda, that’s a great summary. I really wanted to know a little bit more in particular about the second point, about how Amazon is impacting local economies. I asked Carly to expand a bit on why it’s important for there to be space in the market for traditional and smaller food retailers.

**CL**: When we're looking at, at smaller, more traditional retailers, they play a big part of our local economies. And again, if we put this in the context of what has, what we've seen with COVID, it's that global supply chains break down, and we become vulnerable to price fluctuations. We become vulnerable to the ability to even get food imports. If we have, you know, smaller food retailers, local farmer's markets, CSAs, and you know, these sorts of smaller players that exist in the food system, they, they are what kind of come together, and what we saw come together when COVID hit in 2020. They're who make sure that, that people are still able to access healthy food.

**AD**: Okay, so Carly is saying that more smaller food retailers can protect food systems from shocks and stressors, like pandemics.

**HR**: That’s exactly right.

**AD**: Well, other than being a huge player, is Amazon using technology in ways that we should worried about?

**HR**: Yeah, actually, they are. Amazon makes a lot of money off of consumer data collected through cloud computing, Amazon Marketplace, and Amazon Prime memberships to name a few areas. Here’s Carly to explain:

**CL**: Amazon's core business is retail, but it doesn't make most of its money off of retail. It makes its money off of these 3 massive digital pillars that it spent a ton of money and many years perfecting. And so those are Amazon Web Services, which is their cloud computing business; Amazon Prime, which is a paid subscription program that gives customers lots of perks and discounts; and then Amazon Marketplace, which lets retailers pay to sell their products, in this case, food products on its e-commerce platform. So, it's these digital pillars that let Amazon move into food retail and other parts of the food chain as well. And at the end of the day, this is all about data.

Bayer CropScience, which is one of the biggest agriculture companies, relies on Amazon Web services for data collection. Amazon Marketplace gets food retailers who can't afford to establish their own e-commerce platform or who don't want to, or its own delivery system, to become its customers. But the catch is that Amazon is also a food retailer. So, while small “food retailer X” is an Amazon customer, it is also a competitor. And Amazon now has access to that data to understand more about what customers want. And the goal is to one day provide that directly to the customer and render “food retailer X” obsolete.

And then there's Amazon Prime, and Prime has over 100 million members and Prime links discounts with groceries. So, you really can't separate Prime from Amazon's food business because they're so fully integrated. Prime members get discounts at Whole Foods. Prime members get 1 day shipping. They get special days of the year to shop for crazy discounts. And so, Amazon is getting its fingers in all of these different areas of the food chain because of its digital capabilities.

And, you know, when we think about, when we think about regulation or antitrust regulation, which is basically the laws that regulate the conduct of businesses, the focus is almost solely on consumer welfare, which sounds great, because it means that if Amazon wants to acquire Whole Foods and in doing so, prices at Whole Foods go down because of Prime, then that's a good thing. Lower prices equal happier people. If Amazon uses the data from the food retailers using its platforms to create its own private label brand of a product that is cheaper, then great, lower prices equal happier consumers. But, you know, if we're talking about privacy, then the question is, is consumer welfare limited to the cost of food? Because Amazon's playing a different game than other food retailers - - than traditional food retailers. Amazon is in the data game. And the more data that Amazon can collect and mine from us as individuals and from other food retailers, the better Amazon gets at predicting, and then giving us what we want.

**AD**: Oh, that’s bleak.

**HR**: [Laughs]. Yeah, yeah, it certainly feels that way, but Carly did tell me that she’s hopeful. When I asked her about it, she highlighted a couple of ways to move forward, including being more critical of self-regulation by big-tech companies, focusing on good food policy, and finding ways for community food systems and big tech to work together.

**CL**: [Laughs]. Yeah, I mean, it really doesn't sound like I'm hopeful, but I really am. It’s, I think, you know, I've been putting a lot of this in the context of what's been happening with COVID, but there's been so much local innovation and there's been so much evidence of communities coming together too. Here in Toronto, the Toronto Food Policy Council and people like Marina Queirolo fought to have farmers markets and public markets deemed an essential service. You know, organizations like Food Share have been providing healthy, emergency food boxes to folks who are experiencing food insecurity. Open Food Network, if we're talking digital, like Open Food Network is this open-source platform that continues to enable ethical supply chains.

So, you know, those are just kind of a drop in the bucket of what's happening. And, I think, I think that we should . . . I think there's some things that we need to actively be doing as food systems practitioners. And if we want to combat concentration and if we want to, if we want to form a defense, if you will, against Internet companies like Amazon.

First, you know, this idea of self-regulation by big tech companies needs to end and that fight is happening, but food systems policy people have a vested stake in joining that fight. And so, you know, that's one thing that we can lend our voices to. Second, we need policies that incentivize local food infrastructure. We need to take a systems wide approach to research. Lastly, and maybe on kind of a hopeful note is that I don't think, I don't think it's true necessarily that big tech and community food system goals can't ever be reconciled. But right now, one set of goals goes left and another set of goals goes right. And if we're going to remedy any of that, then we need to talk to each other. And I think, up until fairly recently, we've existed in really separate spaces. So, I think we could see the coming together of those two things.

{[Short Music Break]}

**AD**: Okay, so we heard from Carly about why we should be wary of Amazon’s systematic take-over of the online food retail space. Also, we heard from Irena and Kelly about why we need be critical of how technology is used to collect farm and consumer data to maximize profits, rather than to food systems better.

So, how do we move forward? How do use technology to make our food systems more sustainable, and more equitable?

**HR**: Those are really great questions, and there isn’t just one answer. It’s become clear from our conversations that there’s a tension in the relationships between technology and our food systems. There’s promise for digital-agricultural technologies to act as a support system, or as tools to address broader issues in the food systems. But this promise also has a tendency to kind of block our vision, we think of technology as a catch-all, as the only way forward, without often looking at the possible negative impacts, or thinking about who gets excluded from that future view.

I was curious about what barriers are stopping us from realizing technology’s positive potential for food systems. Irena told me that our focus on the market as the primary driver for decision making, along with the way that innovation has come to mean technology, and technology only, has really limited the kind of ways that we can envision food futures for ourselves. Here’s Irena with more:

**IK**: I think the biggest sort of barrier to really thinking about the future of farming in a more comprehensive and more inclusive way is, the sheer legacy of market economy centered government policies around the world over the last few decades.

And unfortunately, many governments around the world, including governments here in Canada, have heavily relied on this kind of understanding of what our agriculture should be like. So, you know, I often talk about how Agriculture and Agri-food Canada (AAFC) as an agency, sometimes, is unable to address a lot of the social and economic issues that surround agriculture simply because it's really technically not their mandate. Like they're an agency that is supposed to support large-scale farming for export. And so, as long as that remains, our priority, it's going to be very difficult for us to push for alternatives, to take a prominent place in how we manage farm futures.

One of the concerns myself and other researchers in this area have had is around how our government agencies, with our public funds, are treating and understanding innovation in agriculture. And what we have found in Canada, at least, that much of the use of that term "innovation in agriculture" really refers to digital technologies only. And so, agroecological farming, for instance, so these are approaches to growing food that are ecologically-sound and are not damaging to the environment, in fact, a lot of those agroecological approaches are regenerative. So, they don't just not destroy the environment, but they actually help regenerate ecosystems. Those approaches in themselves are actually very innovative, but we don't really talk about them in the public realm as innovation.

So, when we think about digital technologies as the only way forward, what we're setting aside and ignoring, are very important issues around the environment, around social equity, around traditional knowledge, around all sorts of other things that can also offer promising futures, not just for farming, but also how we exist as a society.

And so, to use digital technologies as the only future is problematic because, first of all, it's inadequate to completely support our food production around the globe, and it's unrealistic, but it's also problematic because it marginalizes other ways of understanding food production, food distribution, how farmers work with the environment, how farmers position themselves in their communities. All of those things are being marginalized by our focus on this kind of futuristic digital technologies: Star Trek farming.

**AD**: So, it sounds like Irena thinks that we need a major shift in how we imagine solutions to the challenges facing our food systems. And that shift would be away from market driven technology centric approaches to food production, to a more expansive way of understanding what’s important, and what innovation might look like in our food system.

**HR**: For sure. And she thinks that shift would lead to better policies and programs that can actually support more farmers and more farming methods—including small-scale ecological farming. And that these changes will help make our food systems more resilient and diverse. I think Irena summed it all up really nicely, so we’ll give her the last word for this episode.

**IK**: So, there's no denying that there's lots of benefits to technologies. But I think we need to think about the context in which we want to use those technologies, and what would be ethical. And the first thing I think is important to recognize, if we return back to the John Deere notion of Farm Forward that this kind of futurism of farms, is that we have to keep in mind that this kind of technological approach can be a part of our farm future, but is not THE farm future. In other words, that there's probably room for this kind of farming, for these kinds of technologies to be utilized, but we cannot treat them as the only way forward. We cannot treat them as the only way of producing food in the future.

And when I say that I'm really not just relying on my personal opinion, there is all sorts of organizations and institutions that have over and over in the last decade or so, stated that we need a diverse food system. And what that diversity refers to is diversity of crops, diversity of foods we produce, but also diversity of farms, diversity of sizes and approaches, and different understandings of how food can be grown in harmony with nature, rather than working against nature. And so, what an ethical approach that technologies in agriculture would entail in my mind, is an approach that understands that this is a supplement to farming, and not the only pathway to the future of farming.

{[Closing Music Starts]}

**AD**: Amazing! What an interesting conversation, Harrison. I really appreciate you walking us through the complex relationship between technology and our food system. Thanks a lot.

**HR**: Oh, it’s been my pleasure. And, I really can’t thank Kelly, Carly, and Irena enough for their time, I learned a lot from talking to them.

**LY**: Thanks for tuning in to this episode of *Handpicked: Stories from the Field.* We hope that you’ve gained some insight into the relationship between food and technology.

**AD**: We also hope you join us for our next episode featuring Mandy Bayha of the Délįnę First Nation in conversation with Andrew Spring, about Indigenous food systems and climate change adaptation in the Northwest Territories.

**LY**: Thanks to our co-producer this episode: Harrison Runtz, and to our guests: Carly Livingstone, Kelly Bronson, and Irena Knezevic for their contributions.

This episode was hosted and produced by us: Laine Young,

**AD**: and Amanda Di Battista,

**LY**: with research, editing, and sound design by Adedotun Babajide. Our music is composed by Keenan Reimer-Watts.

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**LY**: Please check out our show notes for a bibliography, teaching tools, and links to other relevant information that we used to produce this episode.

Make sure you check out our website with other ways to engage with us. Follow us on Twitter @handpickedpodc and join our Facebook group. You can also reach us by email at handpickedpodcast@wlu.ca

**AD**: We would like to acknowledge that this episode was recorded on the traditional, unceded territories of the Algonquin Anishinaabe nation, and produced on the lands of the Neutral, Anishinaabe, and Haudenosaunee people. We encourage you all to check the land acknowledgement link in the show notes to learn more.

As always, I’m Amanda Di Battista.

**LY**: And I’m Laine Young, and this has been an episode of the Laurier Centre for Sustainable Food Systems’ podcast, *Handpicked*.

**AD**: Make sure to tune in next time, for more freshly picked stories from the field.