Welcome to the Science Podcast for March 29th, 2019. I am Megan Cantwell. In this week's show, I speak with Christa Lesté-Lasserre about what may be behind a string of mysterious horse injuries at the Santa Anita Racetrack in Southern California. And Sarah Crespi talks with online editor Catherine Matacic about the negative downstream effects of cash bail, and what research can tell us about other options for the pre-trial justice system in the US. For our monthly book segment, Books Editor Valerie Thompson talks with author Robyn Metcalfe about her book, "Food Routes: Growing Bananas in Iceland and Other Tales from the Logistics of Eating." You may be familiar with the tale of Seabiscuit, a champion race horse in the 1940s who raced on the Santa Anita racetracks in Southern California. That famous course is currently under hot water for a string of unexplained horse injuries and deaths in the past three months. A total of 22 horses have died in that period of time. I'm here with Christa Lesté-Lasserre to talk about what may be causing these deaths.

Christa Lesté-Lasserre: Thank you Megan.

Could you first talk a little bit about what exactly is causing these horses to die?

The vast majority of these fatalities are related to catastrophic injuries. This occurs because the horse actually has such an extreme fracture that it can't be repaired and the horse either dies immediately, or in most cases is euthanized.

What are the usual risk factors that make a horse more likely to suffer this type of injury?

Age can be related to it. We're talking about older horses and by older horses, I mean, 4-year-olds instead of 2-year-olds are more likely to have catastrophic injuries. Male horses are more likely than female horses to have catastrophic injuries. But more importantly, it's the existence of a pre-existing stress fracture that usually doesn't get noticed. The horses may not show very many signs of it or those signs might get masked for example by anti-inflammatory use, so these horses may be developing very subtle fractures that then eventually snap in the right conditions.
02:49 MC: Another type of risk factor might be the track itself. And scientists went to study the Santa Anita Racetrack to see if that might be a reason for these string of catastrophic injuries. What did the scientists find?

03:02 CL: They didn't see any particular problems. However, it's possible that the current testing methods that they have just aren't picking up all the problems. And it seems to be the case, because clearly, something is causing these deaths and we don't have a scientific explanation for it yet.

03:18 MC: Santa Anita is a dirt racetrack and there are other kinds of racetracks that are synthetic. Is it possible that the dirt track is more dangerous for these horses to race on than synthetic tracks?

03:29 CL: Oh, absolutely, and I think most experts would agree on that, certainly, all the experts that I have spoken with. Dirt tracks do have a greater fracture rate which runs about twice as high as the catastrophic injury rate on synthetic tracks. That's mainly because the maintenance is so complicated on those dirt tracks. I mean, they're very subject to the weather, they vary considerably in their consistency, in the level of compaction, according to how much water is in the track. Whereas with the synthetic tracks those are made of synthetic material like wax, rubber, recycled carpet, and those are hydrophobic. So, they're not really susceptible to the water issues like the dirt tracks are.

04:11 MC: Recently in Southern California, they've had a lot of rain which of course has impacted that dirt track. Could that have been a factor in increasing the amount of deaths?

04:20 CL: Oh, it's very likely indeed. Problem is that the Southern California has had a drought for the past 10 years and so the managers have been managing this track according to very dry conditions, now that they've had up to 19 inches of rainfall at the track in the past three months, they're going into new territory. It's not completely new territory and they certainly are able to get advice from track managers dealing with lots of water, they're not used to it and it can create new challenges for them. And if they're not getting the management just right, yes, it could lead to problems.

04:53 MC: How do they manage it if it's rained a lot?

04:55 CL: Well, for one thing, they try to prevent the saturation from happening to begin with, they do a process called rolling and sealing. They do this overnight to try to keep the water from really soaking into the track itself. Other methods like floating the track where they can allow the rainfall to roll off onto the sides of the track. Once it's dry, then they do a method called harrowing, where it's like combing the track and opening it up and then they have to water it to actually keep the humidity levels as constant as possible.

05:24 MC: The layering of the track itself also introduces complications to maintenance.

05:30 CL: Exactly, because you're talking about four different layers of track. The top layer is called the cushion, and it is designed to absorb the majority of the shock. The horses also need something to push off from to give them their speed, and also to prevent other kinds of soft tissue
injuries from being just too soft, as you can imagine, it would be like constantly running in just deep sand on the beach. So these horses need a layer of push off and that's called the pad.

05:55 MC: When the scientists studied this racetrack, what exactly did they look for?

06:00 CL: What they could do to try to see what's going on with the horses that were injured days before is check the depths of the different layers of the track to see that they're consistent. Because you can imagine they're running across this softer cushion layer and then they're hitting the pad below, and if the pad isn't always at exactly the same level, it could be like stepping into a hole or suddenly having a part of the ground that lifts up and you weren't expecting it, and so, you can strike it harder than you meant to. So from stride to stride, these horses need that consistent depth of the layers, and if they're not getting it, it could put them at risk.

06:36 MC: But there's no way to continuously monitor to ensure that these layers are intact and working as they should?

06:41 CL: Not at the moment, but Mick Peterson came out with his machine, he's the scientist who did the investigations on this track. It drops a metal horse foot if you will, into the ground and it measures the reaction of the track, and it also measures the forces that are occurring on this metal horse hoof, to give them instant feedback to understand the biomechanics that are going on here, and that helps them measure the depth and the bio-mechanical reactions. They were also using ground-penetrating radar to measure the depths from every 10 centimeters across the track. There is also a shoe that can be put directly on a horse's foot, which gives immediate feedback on biomechanical forces of an actual horse hoof going into the track. These are things that are helping them figure out what's going on, but this is not something that is used on a regular basis, and honestly, would be impractical to do at the moment. So, the idea is just to have maintenance protocols in place that will ensure that the track is maintaining its consistency.

07:45 MC: If it's so challenging to maintain consistency in these tracks, why is it that the US hasn't switched over to predominantly synthetic courses?

07:54 CL: They actually did switch over. Santa Anita switched from 2007 to 2010, they had a synthetic track during that time, which was actually required in California, because research had shown that they were so much safer. But the trainers found that anecdotally, it caused more soft tissue injuries. So it wasn't causing the catastrophic injuries, but it was causing soft tissue injuries and they felt like the horse's career lengths were shortened. So, they didn't wanna use them. And generally speaking, the horses, the thoroughbreds that we see in America, the trainers believe that they are for the vast majority "bred" for dirt tracks, they don't perform as well on the synthetic tracks. And if they're invited to an international meet, for example, a lot of times they won't go, because they know that they're at a disadvantage because they run better on dirt tracks.

08:42 MC: Are there any other theories as to why these injuries are happening?

08:46 CL: There is the possibility that it's related to drug use. Most race horses in America run with medication use. It's actually forbidden in most other countries, the horses are not allowed to have
medications on race day itself, but in America, they can. So it's possible that these medications are affecting the horses. For example, the anti-inflammatories might be masking signs of problems that would give a clue to the fact that the horse is at risk of having a catastrophic injury. What makes it difficult to say that that's really the issue however, is that these drugs are being used by horses all across America, and not just at Santa Anita. If that's the problem, I think, we would be seeing a few more issues popping up elsewhere. They could be contributing factors, but there's gotta be something else that's making the difference and that might be the track.

09:37 MC: There still is some uncertainty as to why exactly Santa Anita is experiencing these high deaths, but they're planning on re-opening the track soon, right?

09:45 CL: They are planning on re-opening it on Friday. They are waiting on the decision of the California Horse Racing board to give them the approval to open it, as I understand, that is expected for Thursday. And they are anticipating that that will happen. They have already scheduled races for Friday.

10:02 MC: Thank you so much Christa.

10:03 CL: Thank you.

10:04 MC: Christa Laste-Lasserre is a freelance science journalist based in Paris, France. You can find a link to her story at sciencemag.org/podcasts. Stay tuned for Sarah Crespi's interview with Catherine Matacic on reform and research in the US's cash bail system.

[music]

10:25 Sarah Crespi: In the United States if you get arrested for a lot of different crimes there's a good chance that you'll end up in jail before you go to trial. Sometimes you can pay cash bail to get out of jail and wait for trial at your house, but not always. There seems to be all kinds of unforeseen consequences to this system. Online editor, Catherine Matacic is here to walk us through some of those consequences and talk about what science has to offer in this arena. Hi, Catherine.

10:52 Catherine Matacic: Hi Sarah.

10:53 SC: So, I hope I haven't set up too big of a task for you. What don't you just start with the fallout, some of the issues that people have with this cash bail system.

11:01 CM: Basically, when we're talking about this idea of cash bail, where you have to essentially put down a down payment to get released prior to your trial, the increasing use of this system and the increasing amount of money that judges and magistrates are asking defendants to pay has really driven this argument that the pretrial justice system is biased against poor defendants and minority defendants.

11:28 SC: Right. So that's the overarching issue. So say you're a pre-trial defendant and you're held unless you can provide some amount of money, what are the consequences to that?
11:38 CM: There's lots of consequences for society, and there's lots of consequences for the individual.

11:42 SC: Right.

11:43 CM: Any time behind bars is time that you're not going to your job, it's time that you're not spending with your family, or paying your child support or doing all sorts of things while the world goes by outside and for the state, the costs are actually pretty high. It's estimated that the cost of pre-trial incarceration is about $14 billion a year in the United States.

12:06 SC: Wow.

12:07 CM: On any given day, an estimated six out of 10 people in jail are actually awaiting trial, and I think that is about half a million people a night.

12:17 SC: And there's been pushback. Cities and states are making changes and some of the stuff isn't really based on evidence for what might work best. So can you talk about some of the changes that are just being enacted right now?

12:31 CM: So I think right now for example, New Jersey has basically eliminated cash bail for most offenses.

12:38 SC: And that means that people don't have to pay and they don't have to stay in jail if there's a certain offense in play here.

12:44 CM: Right. And sometimes they have to actually do other things like get tested for drugs or show up to hearings or submit to electronic monitoring. But for all intents and purposes you're right. Related legislation is on the table in I believe 24 or 25 other states right now. And then in some cities, reform-minded prosecutors are really taking things to the next level. So for example, one that I can think of is in Philadelphia, where prosecutors have stopped asking for cash bail for about 25 different offenses.

13:20 SC: As we alluded to before, these are changes that are running ahead of what the science is.

13:26 CM: Oh, yes, absolutely.

13:28 SC: Let's get to the science angle, what has research shown about how likely someone is to show up for court when they have bail pending or not?

13:38 CM: Yes, so I hate to say this, but the findings are all across the board.


13:43 CM: One researcher said that she feels that people right now are flying by the seats of their
pants when they're trying to make a lot of these reforms. A lot of the studies that have happened up until this point basically look at huge databases of statistics and they try to take these big numbers and make comparisons and say, "Okay, we know that cash bail works or it works in these situations or it doesn't work in these situations." And when I say work, what I mean is one, making sure people show up for their trial and two, making sure they don't commit any new offenses.

14:20 SC: Well, when you look across all those datasets style studies, what you find is they're very hard to add up together.

14:27 CM: Right. So one of the problems here is that the data are very difficult to compare, they're also compiled in different ways across jurisdictions. And so, it's really hard to make comparisons. The other thing that's hard to do with these big huge datasets is to infer causation. So there's this huge number of confounding factors, for example, is somebody very high risk or very low risk? Did they commit a felony, did they commit a misdemeanor? What do those things even mean from jurisdiction to jurisdiction?

15:00 SC: Right. So we don't really have a consensus from the literature at this point but now there is research being conducted that seems to be better placed to answer some of these questions.

15:10 CM: Yeah, you're right. One of the big trends right now is, there are a lot more controlled experiments that are taking place in collaboration with law enforcement officials.

15:21 SC: And this Philadelphia case, I think is a really good example. It's not that it was randomized, but that they were able to compare what happened before a change and after a change.

15:31 CM: Right. So getting back to this change that we talked about, and this is the change where I think in February of 2018, the Philadelphia DA announced his prosecutors would no longer seek cash bail for 25 offenses.

15:45 SC: Right.

15:46 CM: They actually reached out to a couple of researchers who are prominent in the field and said, "Hey, we really want you to run an analysis of what happened before these reforms were passed and what happened after, and the things we want you to look at are one, how many people are going to be released who wouldn't have been released before? Two, what is the likelihood that these people are going to show up for their trials? Three, what is the likelihood that they're going to be committing new crimes after they've gotten out of jail? They were able to take I think data from 20,000 cases before and after these reforms took place. They combed through the data and they discovered there was a 12% jump in the number of defendants who were released on their own recognizance prior to their trial.

16:12 SC: Right.

16:12 CM: And three, what is the likelihood that they're going to be committing new crimes after they've gotten out of jail? They were able to take I think data from 20,000 cases before and after these reforms took place. They combed through the data and they discovered there was a 12% jump in the number of defendants who were released on their own recognizance prior to their trial.

16:41 SC: Fewer people in jail, fewer people paying bail and also less money the government has
to spend to...

16:47 CM: Right. And in this case, I think it was like 1700 people, just over 1700 people who were released who wouldn't have been otherwise.

16:56 SC: Right.

16:56 CM: And then the other two things that they looked at as we discussed was the appearance rate at trial and then whether or not any new crimes were committed, and they found that those rates were pretty much the same across the board. And so basically, what this meant they said is that eliminating cash bail appears to have very little effect on court appearance rates or public safety.

17:20 SC: So in Philadelphia they're looking at what if we don't require cash bail for many more crimes and what if we decide not to keep people? You know, we're gonna save everybody a lot of trouble. In Pittsburgh, this is another part of Philadelphia. Or this is another part of Pennsylvania. They're looking at what if we send defenders, public defenders into these hearings where bail is set? Will that make a difference on how people pay cash bail or how people end up in jail before trial? How is that being conducted Catherine and have they seen any results from that yet?

17:49 CM: So, as you may know, these bond hearings are really, really short. Most of them last two minutes or less, and often times the defendant is there facing a magistrate or a judge who's gonna set the conditions for their release. They've got somebody from the prosecutor's office, but they don't have anybody defending them or speaking up for them. And so, what this new study is going to do is it is gonna provide a randomized group of individuals with public defenders automatically from the moment of that first appearance.

18:22 SC: And what do they think that those Public Defenders could change about whether or not they have to pay bail or have to go to jail?

18:28 CM: Right. So the idea is that from the outset, this individual who has been accused of a particular crime has somebody on their side advocating for them, somebody who knows the criminal justice system, who knows the laws and who knows best how to position that client for success. And so, one of the things that they would do is they would be able to provide counsel to the defendant letting him or her know how they should plead, what their likelihood of success is, and essentially chart the course of action for how their whole defense is gonna take place.

19:04 SC: That sounds really interesting. What kinds of measures are they going to be looking at after they do this intervention?

19:11 CM: So after the intervention, the main things that they're gonna be looking at, are there gonna be more detentions fewer detentions? Are they gonna stay the same? They're gonna look at rates of appearance at trial, they're gonna look at future re-arrests, but they're also going to look at a couple of other outcomes, one of which is the likelihood that a defendant will plead guilty. Another one is the long-term effect of pre-trial incarceration on employment.
Right. Okay, and that is something that comes up a lot is that not only if you go to jail, could you lose your job from just waiting for trial and not showing up at work, but also over the long term, if you decide, "I better just plead guilty so I can get out of jail," then you have something on your record that makes it really difficult for you to find work.

So one of the gentleman I was talking to in the course of doing my reporting was actually in this very situation. He was in Philadelphia, he was arrested for Marijuana possession, and the intent to distribute. It was just one of the 25 crimes that no longer requires cash bail. He was held for about a week, and because he lost his job, and because he wanted to get out so he could be back with his family, and supporting his family he decided to plea guilty. After this happened, it set off this whole cascade of events which his wife described as basically this cloud that was following him around and one of the effects of that cloud was that every job he applied to after he got out, essentially rejected him because he had pled guilty and because that was on his record. And that was actually a point that was driven home by another woman who I talked to who is a public defender, she's been in the business for 30 years, and she essentially said, "If you are facing this choice of either paying money you don't have or staying in jail for days, weeks, months at a time before your trial occurs." She says, "Almost everybody is going to plead guilty, whether they did it or not." Now, that's something that is not something that we can necessarily support or confirm by science, but the fact of the matter is, as researchers are working hard to see, at least when is this the case, when is this true, and when is it not true?

Yeah, alright, well thank you so much Catherine.

Thanks, Sarah.

Catherine Matacic is an online editor for Science. You can find a link to her story at sciencemag.org/podcast.

Stay tuned for our monthly book segment. They discuss Food Routes: Growing Bananas in Iceland and Other Tales from the Logistics of Eating.

[Music]

Welcome back to the book segment of the Science Podcast. I am Valerie Thompson, the book review editor here at Science. Today, our guest is food historian and futurist, Robyn Metcalfe, who's here to discuss her new book, Food Routes, Growing Bananas in Iceland and Other Tales from the Logistics of Eating. Robyn, thanks so much for joining us.

Thanks for the opportunity.

Food isn't like other consumer products that need to be moved around. What makes it different and what does that mean for getting it from point A to point B?

When you're transporting food around, you have to think about the fact that the minute food comes out of the ground, it's basically dying all the way to your plate. I mean, it's sort of gross
way to think about it, but basically it's rotting, it's oxidizing, it's changing form, and you don't have that with all of the other things that are moving through the supply chain. So it requires a certain detailed handling and the ramifications of getting it wrong are huge. We put food in our bodies. If it's not done right, it's a life and death situation.

23:00 VT: So I think probably what comes to a lot of people's minds when we talk about food logistics is this idea that we should be trying to minimize the geographic distance between the farms that our food comes from and our tables. But in your book, you talk about why that's not necessarily true. Can you elaborate on that?

23:16 RM: The whole idea of local food is up for grabs, really. I mean, when you think about the distances that anything needs to travel in Texas local might be 500 miles away. But in New England where all the farms are dense and there's small pieces of property, you know, smaller farms, really buying local could just be five miles. One gets caught in this trap of sort of the perception of distance, and it doesn't by definition mean it's better. If you look at economies of scale, something being flown in from Hawaii might actually be better nutritionally, and cost a lot less, and be a lot fresher to your plate, than something that's down the street that may have been sitting around for a while, may not have been raised under the best sort of circumstances and might be 10 times as more expensive.

24:07 RM: So we've sort of attached this local idea to a whole set of values that are certainly debatable. I think the meaning of local could be tied to local economic development. I mean, one really good reason to buy a local apple is to support somebody who lives down the street, or small businesses or somebody that you know, and that's in a business, to keep the economy local. In that way, I think you can probably make that linkage towards, it's better.

24:36 VT: It's one of those things that it's not one way, like, there's a lot of different ways of thinking about it, and depending on which way you're thinking about it, maybe it is better to get certain foods from a further distance than what you would be thinking.

24:49 RM: Right. And supply chains are super complex too. I mean, if you go and you're down to your farmers market, and you say, "Is this meat local, is it locally grown meat?" And someone says, "Absolutely," and then you say, "But, there's no hay around here in Texas. [chuckle] I mean, it does not." "Yeah, well we get the hay from Idaho." So is it local? You could get completely in the weeds, if you begin to pull apart a supply chain.

25:17 VT: So you mentioned that unpredictable weather events can have a big effect on food logistics. Is anyone doing anything to shore up the food supply chain against climate change?

25:27 RM: Yeah, in fact, climate change is ending up to be one of the really big friction points or opportunities I think for technology right now, because supply chain, are basically optimizers. They're trying to find the optimal path from the farm to your plate and they do that around a certain set of constraints, where things grow best where there's a good labor force where there's an infrastructure, there's a bunch of things that are all going into that algorithm of optimization. You change something like the weather, and you change it in ways that's not that predictable, and also
it's changing quickly, it basically up routes the location of where a lot of the food is grown. You've been going down to Guatemala at a certain elevation, and buying coffee beans. Suddenly the atmosphere is heating up, so now you have to move that plantation somewhere else. The supply chain needs to flex and find another way of distribution. This is a big opportunity for applied technology to be able mitigate this change that we're seeing now climate wise. One solution could be indoor growing systems. You could move those coffee beans anywhere you wanted to in order to optimize that chain. You no longer have to grow those beans [chuckle], basically, in Guatemala. There's other reasons you might want to, like to support the local economy. There's an ecology of things that are going on around that coffee bean in Guatemala, and ecosystem.

27:00 RM: But if you really just wanted to get those coffee beans grown and can't be grown in that certain spot, you can create that climate in an optimum position by moving the growing place somewhere else. Another case in point for that is the warming waters of the ocean where fish have to go further and further out or deeper and deeper in order to be in cooler waters, which causes a fisherman to have to travel twice as far use twice as much fuel to get to their catch, but now with sustainable fish farms finding a way to do that sustainably now, through Tech and sensors, etcetera, you can farm that fish and then not see a decline in that, option for protein from the water.

27:46 VT: So related to that, you talk about how food culture and practices move around with people. I guess I'm just thinking the relationship is that as people are displaced by climate change so people who are displaced from places like Libya, and Syria and Sudan are changing these food demands in the communities they're moving into. So, what sort of impact does that have on the food logistics system?

28:08 RM: That's interesting, so each ethnicity has its own food culture. And as they move, they take their food culture with them. They also take their own supply chains often. People who are eating halal or middle-eastern food culture will bring with them, people who know how to process meat what kinds of food and things like that, with them. And they'll be sort of another ecosystem that follows them around so you'll see pockets of these developments in cities all over the United States. I know the Somalians that go to Maine have created their own food culture right there. This is that flexibility of the supply chain, and they'll usually bring that with their own ethnic culture, throughout the supply chain, meaning everybody handling that material, those ingredients to that new location will be that same ethnicity because supply chains depend on trust and trust is usually embedded within relationships that rely on bonds that run very deep.

29:15 VT: I imagine that is good, like it adds like a richness and kind of a redundancy to the supply chain to make sure that we have multiple sources for our foods.

29:24 RM: Absolutely. Choice is what we want. And so, the more options we have and the more variety and the less dependence upon any single provider or any single culture is really a good thing. You're right, it's a richness.

29:38 VT: Let's talk about food waste. So it's something that we're hearing more and more about, and it's a topic that's increasingly being discussed at the policy level. So you mentioned for example in 2016, France passed a law prohibiting grocery stores from disposing edible food. So how are technologists approaching food waste?
29:56 RM: We run, here in Texas, a startup challenge, for food startups using technology to solve many of these problems. And we've seen some really interesting startups come through such as Rise that uses spent grains from beer making. Then they turn that into flour that is then sold to bakers who then sell bread. There's lots and lots of ways of up-cycling waste into very usable food items or other items. I mean into all paper. Utensils, being made out of food waste. The whole material science field, has a great opportunity to think about ways of handling waste. And I think people will generate less waste in the long term. But right now, let's do something with the waste that is being generated and creating energy systems out of it, creating ways to power buildings, some of the biodigesters, that we see out there, those can be made to be more efficient.

30:52 RM: I mean, my dream scenario is that every house comes with sort of the equivalent of a garbage compacter, you put everything in it, right? But basically, it's a mini generator, and in turn will in a very [chuckle] optimized, yet to be seen technology that can convert that into energy that would power your home. I mean, look, you wouldn't have to put those garbage cans out every day, you wouldn't have to be shamed into recycling or composting. You wouldn't pay an electricity bill, you could basically be creating real-time energy, to fuel your own house. I think it would have a lot of not only environmental benefits, but aesthetic ones as well.

31:35 VT: I love that idea, I love it. Alright, let's switch gears a little bit and talk about how advances in genomic technologies are changing food logistics.

31:43 RM: Yeah, that's a great question, because I mean talk about a topic that has divided people around what to do with our food system. We've sort of, sort of survived decades around the whole Monsanto, now Baer, GMO conversation. And it seems to be we're seeing a sort of shift in the conversation towards a lot more acceptance of technology in our food system in general. People who were put off by processed food, now find clean meat or plant-based burgers completely acceptable. And you can't find anything more processed almost. And this CRISPR technology that's coming out, which is basically another form of modifying genetic material, but just doing it a different way, using a different tool the editing tool, I think holds a lot of promise a lot of potential, for being able to make some foods more drought resistant. When you talk about climate change some of the things that are needed to be able to do that and also when personalized algorithmic diets come on the scene being able to design food specifically for you or I. I think we barely know what that's gonna look like and we certainly have a long way to go to actually decide how to target that technology so it's something that's really useful, and that really solves the problem. But I think there's new tools, I think the whole genomic thing, whether it's a biome genome that you're looking at, or food being able to be decoded into data. There's an interesting road map there. It will be interesting to see how it goes.

33:22 VT: So we talk about incorporating more and more technology into the food supply chain isn't always a good thing. It can now also create security risks. Sounds like there's a lot of work to be done in that space.

33:35 RM: I'm a technology optimist. I think all of this technology is going to dramatically transform the food supply chain, the food system for the better. But at the same time, I think we have to have eyes wide open and I think that... I don't know if you're familiar with Black Mirror, the
television episode. This should not be a Black Mirror experience. We don't wanna find ourselves in a situation where we've gone down the road so far, that it's really hard to put safeguards back in.

34:05 VT: Alright, talking about a Black Mirror experience, can you please tell me why someone thought it would be a good idea to use facial recognition software to track individual chickens through the supply chain?

34:18 RM: Well, it turns out in this particular case, this is a company in China, where rural tourism is big thing or being able to see, chickens on a web cam are a big thing for urban populations. And so, if you're advertising cage-free chickens, the argument, the marketing strategy here is, "Well, you can actually make sure that your chicken was walking around, and wasn't caged up and you can actually make sure it's going places." The potential there for that is that if you can actually monitor individual animals and it's coming up for... I mean, I hate to say it, there is cow face recognition.

35:00 VT: Oh, no. [chuckle]

35:00 RM: And if you're really into being tongue tied, there's fish face recognition. It's being used by conservation groups to make sure that fishing stocks are not being over-fished or...

35:12 VT: This is a dumb question but you can tell fish faces apart. [chuckle]

35:15 RM: You can. I mean seriously AI machine learning folks that are doing that so, if you can do it for humans, right?

35:25 VT: Sure.

35:26 RM: So all you have to do is teach it. Here's a chicken face, here are all the various permutations on what a chicken face... Wouldn't you love to be on that design team?

[laughter]

35:36 RM: But anyway, it's there whether we like it or not. And I think that I have learned over time that after the laughing subsides, you turn around and "Oh my gosh, there's actually something there." So I've learned to laugh and then sort of wait [chuckle]

35:51 VT: Sure yeah, I love it. Alright, well with that we're gonna have to wrap things up, so thanks so much for joining us today, Robyn.

36:00 RM: Thank you for the opportunity, it's super fun.

36:02 MC: And that concludes this edition of the Science Podcast. If you have any comments or suggestions for the show, write to us at sciencepodcast@aaas.org. You can subscribe to the show anywhere you get your podcasts. Or you can listen on the Science website that's sciencemag.org/podcasts. To place an ad on the Science Podcast, contact midroll.com. This show was produced by Sarah Crespi and Megan Cantwell, and edited by Podigy. Jeffrey Cook composed
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