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The Legal Role in Building Sustainable Public Health (Symposium Transcript)

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THE LEGAL ROLE IN BUILDING
SUSTAINABLE PUBLIC HEALTH

SPEAKER:

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[edited for reading]

FEBRUARY 18, 2022

Lauren Caverly-Pratt: We are now going to move into our speaker session. Our first academic speaker here is Professor Joanna Sax, the E. Donald Shapiro Professor of Law at California Western School of Law. Professor Sax earned her Juris Doctor from the University of Pennsylvania Carey Law School in addition to earning her PhD in cell and molecular biology from the University of Pennsylvania Perelman School of Medicine. Given this impressive background, it makes sense that her research sits at the intersection of law and science. She has a particular interest in how advances in science can translate into our everyday lives. As the slide says, she is widely recognized for her work on food policy in this vein, particularly FDA regulation of dietary supplements and genetically engineered food. She also really enjoys teaching, and in 2020 she was awarded the Professor of the Year award at California Western. Professor Sax, thank you so much for being here with us today.

Dr. Joanna Sax: Great, well thank you so much. I'll share my screen before I start talking. Let's just make sure that that works; if you could nod and let me know, can you see my slides? Yes, you can, ok great! Well, that's the first potential issue. Well, I just want to thank everyone so much for being here today and I want to thank Lauren, and the journal, and Professor Farringer for inviting me, and I hope this is the beginning of a relationship so I can get invited in person to Nashville. So, thank you so much for all your hard work behind the scenes to make this happen.

And to take a little bit of a left turn compared to the keynote speaker and the panels who have largely focused on health care delivery, which is very important, and I'm going to talk about another component of public health which is food. Which initially, you might not think that food is a public health issue, but it is, and we often think of food as a public health issue to the extent that we think of it that way with respect to our SNAP program or our school lunch program. But food overall is a public health issue, because of not only because of food security, but because of its intersection with climate change, and climate change is going to create a lot of public health issues. So, this talk will be a little bit different than the other one and I look forward to any questions at the end.

The overview of the talk is I'm going to say a little bit why food is a public health issue. I'm going to talk about why science matters and utilizing science to solve food as a public health issue, especially as it relates to sustainability and climate change. Then I'm going to talk a little bit about consumers' perception of risk and why consumers' perception, or really misperception, of risk created by

new scientific technologies, or even applying older scientific technologies, is misplaced, and we can actually kill technologies through the consumer component and then we don't have those technologies to solve our problems. I'm going to talk a little bit about why consumers might inappropriately assign risk to certain scientific applications and then ways that we might want to think about resolving that issue or closing the divide between consumer misperception of risk and evidence-based assessment of risk with possible interventions.

Food is a public health issue, malnutrition is the leading cause of death and disease worldwide, and climate change is an existential crisis, and that's actually a hard thing to say in the face of all of our other existential crises, including the pandemic which we're hopefully starting to come out of the pandemic mode. The climate change is going to significantly impact our food supply, and it's going to make malnutrition a worse problem even though malnutrition is currently the leading cause of death and disease worldwide. So, we need to talk about the relationship between agriculture, our food supply, and climate change. I'm going to focus on a sort of niche area in this, there's other areas in our food supply that certainly have a relationship to public health, there's other areas of our food supply that have relationships to climate change like transportation, for example, and so I'm really going to narrow down into just one of the issues that makes food a public health issue. My area is on genetically engineered food which is colloquially known as GMOs, and GMOs is sort of a subset of the genetically engineered food supply, and it's genetically engineered, broadly speaking, which is probably the more appropriate term, is the use of molecular techniques to alter seeds that are ultimately brought into crops and contribute to our food. I'm only going to focus on crops, you can have genetically engineered animals that raises different issues that I won't get into today, but I'd be happy to talk about it in the Q&A.

I think the biggest thing that consumers might misunderstand is that our entire food supply is genetically modified. We do not eat wild type varieties: corn, wheat we can't even self-propagate anymore, all of our major crops, strawberries, green peppers, these are not the wild type varieties. We humans have domesticated these crops over thousands of years, and the way that humans have domesticated these crops is through altering the DNA of the crops. Now thousands of years ago humans didn't even know that that's what they were doing, that they were causing molecular changes, that wouldn't come about until about the 1800s that we even understand that DNA, that traits were heritable, I'll move on from that word, and sort of the techniques particularly in the 20th century

or the first half were these mass mutagenic techniques using chemicals, using radiation, treating seeds with these highly mutagenic techniques, growing the seeds up in the commercialization process, finding a better tasting strawberry, a better looking green pepper, a better yielding corn. And that those domesticated crops are our food supply, and through the commercialization process our food supply is very safe; so even organic farming which has sort of been disconnected from the GMO movement, all of the crops grown in organic farming are genetically modified. They are genetically modified through these mass mutagenic techniques, so organic farming does not mean that you're not eating genetically modified crops, that just means that you're not eating genetically engineered crops. Well, in the 1970s we started to learn more about the molecular basis within particularly mammalian cells, bacterial cells and this translated over into plant cells and over the next 50 years scientists figured out ways to do more precise genetic changes to crops, so instead of having to use the mass mutagenic techniques, radiation, chemical mutagenesis scientists were able to obtain desired crops through more precise mechanisms. That's the genetically engineered crops. The genetically engineered crops are utilizing advancements of science to make more precise genetic changes that are arguably more well understood, and the risk of an unsafe crop is likely less than that of the mass mutagenic techniques, and I should say the risk from the mass mutagenic techniques is also zero by the time the food gets through the commercialization process. But there's been a lot of misinformation about GMOs and genetically engineered crops which I'll talk about in a minute.

But, let me just talk about some of the things that genetic engineering techniques are able to do that we can't do with the traditional mass mutagenic techniques, and one example is golden rice. Rice is a staple crop in many areas of the world, and in some African nations there's a deficiency, a vitamin deficiency, where children at dusk can no longer see. They just they lose their sight at dusk, they need light to see, so they have to go into their homes and sort of their day ends at dusk, and golden rice is fortified genetically with the vitamin that creates this blindness, this night blindness, and it makes the rice a golden color. So, one idea is to use these genetic engineering techniques to supplement foods with nutrients that are severely missing that lead to malnutrition and disease, and there's a long political story behind golden rice. There's no safety issue, but there's a big political component. So, we can use these genetic engineering techniques used to make more nutritious food like golden rice.

Another example is the honey sweet plum. Plums are subject to viral infections; the honey sweet plum is genetically engineered to resist this virus that's carried by aphids which are like little bugs that will infest the plants. There's no safety issue, but our EPA requires that that be labeled as a pesticide, the fruit be labeled as a pesticide, which means that most consumers will not purchase fruit that is labeled as a pesticide. The other alternative is to treat plums with external application of pesticide, and in that way, it would not have to be labeled as a pesticide. The use of pesticides are an environmental issue and allow, and creating crops that are more pest resistant means that we use less external application of pesticides so that's another advantage.

Drought tolerant crops could be another example. Those are harder to create, but can we grow crops in a way with using less water and that's also going to be important as our climate changes. Some in the literature have called for the combination of organic farming techniques and genetically engineered crops, pest resistant crops, less pesticide which is an organic farming technique and many have called for that, but the organic farming industry sort of the big lobbying group has opposed those calls although organic farmers themselves may not share that position.

OK, so consumers are, we know that consumers are resisting genetically engineered crops and we see that through calls for labeling laws, and people we also know through studies that I've done⁷ and others that consumers like the label natural, even though the label natural doesn't actually have a regulatory definition. But it's important to understand why people are rejecting using science to improve our food supply. I focus on multiple theories and I'm just going to talk about two today. I don't have a ton of time, but two theories that I've drawn from social science literature are affect and ambiguity. These are well studied theories for many decades, so my description of them in the next 30 seconds certainly does not do justice to the large amount of research, but affect which is a term pioneered by Paul Slovic says that emotion drives risk perception.⁸ Fear and dread, if people experience feelings of fear or dread, they assign high risk and a low benefit regardless of the evidence based risk assessment that should make sense. People, for example, might be afraid of a plane crash so they're scared to fly, but the data says, the data tell us that the drive to the airport is actually more risky.

⁷ Joanna Sax & Neal Doran, *Food Labeling and Consumer Associations with Health, Safety, and Environment*, 44 J. L. MED. & ETHICS 630, 635 (2016).

⁸ Paul Slovic & Ellen Peters, *Risk Perception and Affect*, 15 CURR. DIR. PSYCHOL. SCI. 322 (2006).

Ambiguity aversion, this is work by Daniel Ellsberg,⁹ and many people since then that says that if people receive missing or conflicting information and they sort of can't separate out, if they received conflicting information, they sort of can't separate it out and they assign a high risk. We see this, for example on vaccine hesitancy, if people hear a link between vaccines and autism, to be clear, there is no link, they sort of can't forget that information. It becomes ambiguous to them, and they become hesitant to vaccinate.

I look at these theories to try to understand consumers' perception of risk, and I know I only have a couple minutes left, so I'm now going to speak super-fast, if you didn't think I was speaking too fast before, but this consumer misperception of risk matters because if we want to have regulatory structures that follow the science these are going to be rejected by consumers, that we're not going to have compliance with these policies. One example, of course, is vaccine mandates and the vaccine hesitancy, for example, to the COVID-19 vaccine was entirely predictable, we already knew that consumers were inappropriately assigning risk to vaccines and so we knew that there was going to be a problem with vaccine uptake and there really was not a lot done to deal with vaccine hesitancy. We know that consumers oppose genetically engineered foods, this is not as robust as the vaccine hesitancy group or even the anti-vaccine group, but it's predictable, and so we need to align consumers' perception of risk with evidence-based assessment of risk. It doesn't mean that consumers have to buy genetically engineered food, it doesn't mean that we have to tell them what food to buy, but they should at least have an appropriate risk assessment. I look a lot at, sort of, why this divide between consumer perception of risk and evidence-based assessment of risk is increasing and I look at it with food, and I look at it with vaccines, and fluoridated water, and other areas of scientific advancements and the three variables that I've been focusing on recently are individualism, the Internet, and economics.

Individualism refers to the sort of rise of the movement away from communities, or people realize, are sort of living in small knit communities into sort of more thinking about themselves and there's actually advantages to this, like in the 1950s these small knit communities just bred racism, sexism, bigotry and the movement away from that particularly in the 60s and 70s didn't solve those problems but it highlighted those problems. There's a lot of advantages to individualism, but there's some disadvantages too

⁹ Daniel Ellsberg, *Risk, Ambiguity, and the Savage Axioms*, 75 Q. J. ECON. 643 (1961).

which is that people don't feel like they have to be part of community and make decisions based on the community.

The Internet, I hope I don't have to go into this too much, but of course there's a lot of misinformation on the Internet. People read this misinformation, they think it's real, it's presented very convincingly, it creates emotions, it creates ambiguity, and so this sort of feeds misinformation.

And then the economics, which is that there are groups and individuals who make a lot of money off of misinformation. We know like the anti-vaccine movement, a public figure Joseph Mercola, says you don't have to take vaccines here's this alternative herbal supplement and here's a natural way to build immunity and there really is no alternative to vaccines. So, there's a lot of money to be made to create this sort of schism with consumers.

My research is focused on well how do we close the divide between consumer misperception of risk and evidence based assessment of risk and there are ways to determine whether emotion or ambiguity aversion if we can, sort of, overcome these decision making theories to allow people, or utilize the decision making theories in a way that allows people to appropriately assign risk, and we can test these variables of individualism, Internet, and economics. You have to have some sort of intervention and maybe it's like social media, for example, or maybe it's a campaign by the CDC, and you sort of drive at people's emotions toying with this variable of individualism and you might see that you get some movement in consumer perception of risk, and you might find that with that same intervention using sort of correcting information on the Internet that you might get a more robust response, or under other scenarios that same targeted intervention wouldn't work as well sort of given the variables. This is a thought experiment; this last slide is a thought experiment in the sense of it's probably not just going to be one intervention. We're probably going to need to test and implement bold, simple interventions in order to figure out how to close the divide between consumers' misperception of risk and evidence-based assessment of risk so that consumers don't reject a technology to improve our food supply and lessen our impact on climate change. We can draw from another public health issue: smoking research, that would be another example, where interventions have been very effective and so we can draw on research from that area to see how we can close this divide.

So, that is 20 minutes which is what I was told, so I'll just say thank you.

Grace Benitone: Thank you so much for that 20 minutes. We do have time for a few questions if you are willing to answer them.

Dr. Joanna Sax: Absolutely!

Grace Benitone: One of our members of our health law journal is actually really interested in the role that marketing and law play in this issue, and you kind of touched on it a little bit at the end about social media and CDC campaigns, but, as well as the smoking research, are there any other examples of this emotional campaign that can help reduce the food insecurity issues that you may have seen?

Dr. Joanna Sax: Well, I've definitely seen sort of the opposite of your question, I've definitely seen marketing campaigns that create the fear, that create the dread. For example, there used to be this commercial where cows can be treated with this bovine growth hormone that they keep lactating and it's called RBST, and there's been no human health effect of it, I mean we can discuss the animal husbandry issue, but there's been no human health effect of eating dairy products from cows treated with RBST, and there was this commercial several years ago that portrayed RBST as this huge swamp monster coming after a child and was very terrifying, and then it was like: our products don't contain RBST. It was clearly a fear based, clearly fear based, and I've talked about in my research like: OK well we should use emotion to promote the correct facts, and sort of the problem with that is that it is very manipulative. I mean, they're manipulating the misinformation and then the question is do you want to be manipulative with the correct information, and so the answer is yes, you could do marketing techniques and utilize emotion and utilize the decision-making theories, and I would suggest that we do use emotion and we do consider ambiguity aversion, but we be honest about it. We're trying to get you emotionally, we're trying to resolve a conflict, so that it's not sort of secretly manipulative, it's perhaps openly manipulative.

Grace Benitone: Towards the end of your presentation as well you mentioned that there's a need to test different interventions. Do you have any ideas for what kinds of interventions or, yeah...?

Dr. Joanna Sax: Yeah, no that's the next area of my research. I've been trying to think about it. I think social media is a good intervention, because utilizing social media is a good intervention in the sense that people are on social media, and you can do like focus group studies or other survey studies where you give people an

intervention like a marketing, you know sort of how we were just talking about, you know where you sort of manipulate their emotions and you see if messages over social media can change people's perception of risk or allow them to appropriately assign risk. I think that's a place to start utilizing social media. Now, there's a problem with that because do you want the government sort of teaming up with social media to manipulate people? There's sort of an obvious externality there, so I think the research will go slow. Social media could be a way to start, but then you're going to run into sort of the relationship between the government and the private actors, so it's a good question. It's to be determined.

Grace Benitone: I'm looking forward to seeing that research play out, definitely interesting. I'll just ask this one last question. One of our members of our journal also was curious if you had any perspective on how climate change influences food security. If there's anything that you've noticed throughout your research that would play into that?

Dr. Joanna Sax: Well, it is. I mean it's actually; I mean how we grow our crops and where we can grow our crops is going to be significantly affected by climate change. It's not just that crops need certain temperatures and that's going to change. It's that we're going to have different pests, in different climates. So, just in terms of crops and agriculture, climate change, I mean, we could have significant food security problems particularly in poorer nations where there they have different pests all of a sudden and the crops have no innate ability because they've never been exposed to those pests before. I think climate changes is, and this is hard to say because we have a lot of problems, it's the thing that we need to be focused on because it's going to affect everything. Food is one component, but it's going to affect everything, and every public health issue is going to be driven by climate change. So, that's positive right, that's my positive end.

Grace Benitone: Yeah, I'm actually going to ask one more question as well. We had a student wondering if the current law stands more on, or leans towards, creating security or sustainability of food, and if you want to speak to perhaps the difference of those as well, I'm sure some audience members would be interested in that.

Dr. Joanna Sax: Yeah, well, if I just think about the U.S., so the U.S. if we think about sort of our SNAP program and our school lunch program, it's trying to go for food security, but the problem is that the food's extremely unhealthy, that the most inexpensive food has very little nutritional value. I would say that the government

likely thinks, our government likely thinks that it's addressing food security but it's doing so at the expense of other public health issues: obesity, diabetes, actually you can be overweight and malnourished at the same time. I think, and also, we have significantly subsidized you know corn, wheat sort of our commodity crops. I don't think our government thinks it's dealing with food security, but I would argue that it's inadequately dealing with that, and I don't think our government does a lot, I mean the EPA because it regulates pesticides, that I would say that that agency would likely say that it's interested in climate change, and some of its policies are, some of its policies are not, so also sort of an unsatisfying answer as well but a good question.

Grace Benitone: Great. Well thank you so much, it's very interesting and I think I'm going to go ahead and hand it back to Lauren, she'll go ahead and move us forward with the day but thanks so much for chatting with us.

Dr. Joanna Sax: Thank you for having me. I really appreciate it.

Lauren Caverly-Pratt: Thank you, Grace, and again, thank you Professor Sax. Like Grace said, that was so interesting. I would honestly love to hear you speak a little bit more on the topic but unfortunately, we do have to keep moving along with our day. Thank you for being here with us virtually and I hope that we'll be able to get you out to Nashville someday in the future in person.