

Simran Sethi: From the Sanford School of Public Policy at Duke University, this is Ways and Means. I'm Simran Sethi.

(Nature Sounds)

Simran Sethi: It's late morning, and we're in a hot field in rural North Carolina, a half-hour outside the city of Durham. Rows of solar panels are silently drawing energy from the sun. And also—scattered among the solar panels—is a small flock of sheep! They're here with a very specific job to do: graze enough so the grass doesn't block the panels.

(Nat sound)

Simran Sethi: The sheeps' efforts definitely benefit the climate. The more electricity we get from solar panels, the less fossil fuel we have to burn. But there's another upside too...it's a hidden one: As the sheep graze over a period of days, their keepers use portable fences to keep them on the move, shifting them from one section of the field to another. Researchers are just beginning to understand how important this kind of movement is, not only for the animals, but for the environment. Strategic movement of animals like this—which may seem small—can actually be a boon to addressing the climate crisis.

(Introduction Music)

Simran Sethi: In this episode of Ways & Means, we explore the impacts of meat production. Can we find a better way to raise animals as food and help the planet at the same time? This is the third in our series Climate Change Solutions, a look at surprising answers to the question of what we can do to help cool a rapidly heating planet.

Cameron Oglesby: My family owns a piece of land up in Maryland just outside of DC. It's been in my family for five generations now, I'm the fifth generation.

Cameron Oglesby is a graduate student at the Sanford School of Public Policy at Duke who has looked closely at problems in the way Americans raise meat. Cameron grew up visiting her family's farm in Maryland, which is nearly 100 years old. And later, as a journalist, she reported on the hog industry, specifically factory farms in North Carolina.

Cameron Oglesby: Oftentimes you'll have thousands of hogs cooped up in a single barn. They don't have very much room to move, let alone sit down. They're just expected to do their business wherever they're standing, and it'll get collected by slats in the floor.

Simran Sethi: Most of our meat in the United States comes from factory farms. About 70% of the cows, 98% of the hogs, and 99% of the chickens and turkeys that we consume come from CAFOs, or Concentrated Animal Feeding Operations, also known as factory farms. Animals are confined at 45 days or more per year in an area without vegetation. They might be housed in open feedlots, or massive, windowless buildings where they are confined in boxes or stalls. Swine CAFOs, for example, allot as little as 8 square feet per animal. The pigs typically live and die in confinement indoors – viewed as a cheap source of protein rather than sentient beings.

(Music)

Simran Sethi: Animals that are raised in this way eat mostly grain. But animal feed in the U.S. can also contain rendered animal parts, dried manure, metal compounds, and even plastic. And those same animals get steady doses of hormones to make them grow bigger, and antibiotics to ward off disease, which spreads easily in cramped conditions. North Carolina is one of the leading hog producers in the country. It has over 2,000 hog CAFOs, mostly in the eastern part of the state. And these factory farms collect hog waste into open-air cesspools that the industry calls “lagoons.” A single large industrial hog farm, with 800,000 pigs, can produce over 1.6 million tons of waste a year. That’s more than the city of Philadelphia! To lower the levels of waste in the lagoons, farmers spray it into the air over adjoining fields. Here’s Cameron to explain.

Cameron Oglesby: People who live nearby these spray fields are inhaling this waste... pretty consistently. It's harmful for people's way of life. People have trouble leaving their houses, going outside, putting laundry outside, has been a common story. And just the smell makes it undesirable to live there. It's a basic human right to be able to go out onto your property and enjoy the environment out there. And people have found it hard when literal poop is being flung in their faces every other day.

Simran Sethi: Literal poop. The people who are inhaling hog waste that is sprayed on the fields are overwhelmingly from marginalized backgrounds – low-income folks and communities of color. On top of the indignity of the stench, hog waste pollution can also cause significant health problems. A 2021 study on CAFOs in NC showed those in the high CAFOs exposure group had significantly higher risk of anemia and kidney disease mortality than those with no exposure. Researchers have also found higher rates of asthma among children who live near these huge farms. And of course, personal health is directly tied to environmental health. Hog waste can contaminate nearby groundwater and compromise air quality. And hog lagoons contribute directly to climate change.

Cameron Oglesby: The chemical processes taking place in these lagoons inherently produces more methane and more emissions... more harmful, atmospherically harmful, gases than if you were to house it in a dry state.

Simran Sethi: As a greenhouse gas, methane is 30 times more potent than carbon dioxide. And those gases are present in lagoons in massive amounts. So, there are a host of reasons to move away from industrial-scale animal farms. What are the alternatives?

(Farm Sounds)

Simran Sethi: Johnny Rogers raises sheep and cows. And his farm looks about as different from a CAFO as you can get.

Johnny Rogers: Now we’re here in one of our calving pastures. The ones having their second calf are obviously coming three-year-olds now, and they’ll...

Simran Sethi: Johnny runs a 450-acre farm near Roxboro, North Carolina. His ancestors -- as far back as he knows—his grandparents, his great-grandparents— they were all farmers. On a warm, cloudy afternoon, a few dozen Red Angus heifers and calves graze in a fenced-off field, where they have plenty of room to roam. There’s also a pattern in place because Johnny is an expert on the art of moving animals around a property...strategically

Johnny Rogers: What we see here in this pasture, we've got part of it that has not been grazed yet. It's segregated with that temporary electric fence. And we've been giving them enough grass to last them one to three days.

Simran Sethi: Sheep and cows don't just lower their heads and eat whatever's in front of them. They look for their favorite plants—and they eat the tastiest and often the most nutritious ones—first. If you leave the animals in one place for too long, they'll overgraze those grasses and leave you with a field full of plants that they like less. Plants that we tend to consider “weeds.” So, Johnny fences off the animals and has them eat the stuff that's not necessarily their favorite, fertilizing as they go. That allows the grasses and plants in the surrounding paddocks to grow bigger and stronger. And they develop deeper and thicker root networks. Those new roots draw carbon from the atmosphere. And the taller the plants, the deeper the roots. Johnny says tending his herd this way is good for the animals and the environment, even if it looks a little rough.

Johnny Rogers: There's times when it's not very pretty. Because sometimes you let the forage grow up really tall, and unfortunately, a lot of farmers, and a lot of those even outside agriculture, have this perception that a well-managed pasture looks like a golf course. And nothing could be further from the truth! You want a very deep root system, to harvest water, to feed the soil microbiology, and pull in nutrients for your plants. So, we need to let our plants grow taller out in our pastures.

Simran Sethi: Managing animals so plants on the farm grow deeper roots is pretty magical. Deeper roots make more space in the soil to capture rainfall, which cuts down on flooding and helps plants survive periods of drought. Taller, healthier grass means farmers get more from their own fields, so they don't have to import as much hay or grain. The soil health improves, and the fields get more fertile and productive every year. But despite the savings on feed, pasture-raised animals can't match factory farms on price. Factory farmed meat is cheaper – on the surface. Other costs – like the environmental and health costs of raising animals this way – aren't reflected at the cash register. For now, meat from pasture-raised animals remains a niche product. A small, but essential niche...that's growing.

Jennifer Curtis: All right, this is our freezer...[Freezer door slides open] And in here we store meat at -10°. You'll notice our sausages are right here, we've got beef over here, lamb over here, and it's quite chilly.

Simran Sethi: For the last 15 years Jennifer Curtis has worked to connect small, sustainable farms, like Johnny Rogers', with buyers. Her company is called Firsthand Foods and it is a \$2 million a year company. It's based in a warehouse in an industrial section of Durham, North Carolina. Cuts of pork, beef, and lamb arrive from slaughterhouses, then are sorted, packed, and sent out to restaurants and small groceries.

Jennifer Curtis: What I'd love to see is just serious public and community investment in the kind of agriculture we wanna see make happen. Will I think it can completely replace commodity agriculture? Probably not in my lifetime. And I'm not sure that's entirely what we should be asking ourselves. But could we increase from 2–4% of what we're doing to 25–35% of what we're doing...? Yes.

Simran Sethi: Like Johnny Rogers, Jennifer can cite a long list of benefits of pastured farming. It's good for the environment, for animals. It's good for consumers – Jennifer says they can taste the difference. And it's good for farmers, too:

Jennifer Curtis: They constantly talk about how they can't wait to get done with their day job and get to the farm and just, their blood pressure goes down, and they love tending to these creatures that are going through pretty rapid cycles of birth and death. So, they are really connected to the land through these animals. And I feel that sense of calm when I'm with them.

Lee Miller: Welcome to the farm, let's take a walk.

Simran Sethi: Lee Miller, a professor at Duke University's School of Law, lives on a 20-acre homestead with his wife and child. It feels a world away from the city of Durham, even though it's only a half-hour drive from town. The sheep we heard at the top of the episode regularly graze on his property.

Lee Miller: The way that our pasture looks, which is messy and diverse and full of lots of different species, that's exactly how we want it. It looks much like a child's bedroom; it looks kind of chaotic and things spread all over the place.

Simran Sethi: This idea that a field of tall grasses is "messy," that it's "not pretty" – that has a history. Over time, as industrialized agriculture took hold, American farmers were encouraged to tend manicured fields. Farmers whose fields didn't look manicured were made to feel backward, that they weren't modern. Lee says it's time to rethink those ideas about what makes a farm beautiful. Lee got a taste for farming when he was a grad student at Duke, where he volunteered at the campus farm. And after law school, he returned to Duke, where he teaches and studies agricultural policy. But he keeps one foot in the soil, believing it helps him understand the real-world choices farmers make. He applauds the work of people like Jennifer Curtis, who are linking farmers doing the right thing to consumers willing to seek out and pay for better, more ethical meat. But he knows there is more work to be done.

Lee Miller: I do not believe in the notion that we will solve the problems of our food and agriculture system by voting with our forks. The truth is that when you walk into the grocery store, your options are highly constrained by a bunch of factors that you have absolutely no control over.

Simran Sethi: So how do we create systemic change?

Lee Miller: If we wanna take control back, the way to do that is through the way that we express our values collectively as a society, and at the end of the day, that means policy, right? In a democracy, the way that we're supposed to make decisions together is to vote people into office who will pass laws, and make regulations, and create tax incentives, and do all of these things in the name of the public interest.

Simran Sethi: The power is in our vote – and in holding the elected officials who work for us accountable. Lee Miller studies the regulation of factory animal farms. He works for Duke's Environmental Law and Policy Clinic, which is co-directed by his law school colleague Michelle Nowlin. Michelle came to Duke after working for the Southern Environmental Law Center in the 1990s. It was a period of radical change in the livestock industry when factory hog farms spread like dandelions across the Southeastern U.S. She says the changes happened so fast, regulators were caught off guard. And now the systems are entrenched. She says the main federal laws that govern farming, known collectively as the Farm Bill, actually subsidize some of the worst practices. We, the people, through our taxes, are paying for these giant lagoons of waste.

Michelle Nowlin: The federal farm bill subsidizes the waste storage lagoon themselves. So, you can get cost-share money to dig a lagoon. And so, we're also subsidizing the very practices that are causing a lot

of this harm to ground water, to surface water, to air quality, to human health, and contributing to climate change as well.

Simran Sethi: Three years ago, Michelle Nowlin and Lee Miller designed an interdisciplinary course at Duke to try and figure out what kinds of federal and state policy changes could help make sustainable farming more widespread. One question they considered was whether changing how we raise animals could help the planet. Could livestock operations be “net negative” on carbon? A farm releases greenhouse gases into the atmosphere. But, what they asked was could it also absorb carbon dioxide through vegetation – and offset how much is released? Scientists studied one farm in Georgia called White Oak Pastures that had much lower emissions than conventional farms – 66 percent lower. Now to get this good outcome, White Oak needed 2.5 times as much land as a conventional farm. If we were to replace all the conventional livestock operations in the country tomorrow with White Oak-type farms, they would produce much lower emissions. But they would also produce much less meat. Which, climate scientists tell us, is exactly what needs to happen. The huge demand for meat has wreaked havoc on the world’s environment. And who consumes the most? According to the Organization for Economic Cooperation and Development, it’s the United States. Our voracious appetite for beef contributes to deforestation in the Amazon, that we covered in our first Climate Change solutions podcast. So, we need to consider eating less meat, and finding better ways to produce the meat we do choose to consume. Like using the grazing methods used by places like White Oak Pastures. Duke’s Michelle Nowlin and Lee Miller are encouraged by the White Oak study and other related research. That’s because it’s becoming clear that when farmers use sustainable practices, it’s hugely beneficial to the farms, as well as to nearby communities.

Michelle Nowlin: What we learned in working with scientists and studying more of the literature, is that the real benefit to these types of practices is actually protecting of the farm itself. It's mitigating the impacts of climate change on agriculture. And so, these types of practices really have been proven in a lot of different environments to be much more beneficial for the farmer, and for the animal, over time. That's better for those local economies. It's better for the people who live in the communities where those facilities exist. So, we've seen that that's the real benefit from adopting these practices.

(Music)

Simran Sethi: This grazing method has a name: regenerative grazing. In reporting this story, multiple people told us that while “regenerative” might be the latest buzzword in sustainable farming, it’s also the oldest type of farming on earth. For most of human history, we didn’t have synthetic fertilizers for crops, and most animals weren’t fenced in on plots of land. Instead, farmers were dedicated to protecting the soil’s long-term health. And often, animals were free to roam. That’s particularly true of Indigenous peoples. The Pueblo people lived close to the land, with respect for its cycles and offerings, in what is today known as the Southwestern United States. This was the way of life for thousands of years, long before the Spanish arrived. A-dae Romero-Briones grew up in Cochiti Pueblo in New Mexico, where her grandparents grew corn and other crops. Today she directs the Native Agriculture and Food Systems program at First Nations Development Institute. A-dae remembers her first encounter with Western farming practices:

A-dae Romero-Briones: I remember going into the fields with my grandfather and walking around that area and seeing unused fences. And they were, like, rolled up and, you know, there were vines growing over them. And I asked him what those were. And he said those were fences that the extension agents

brought to us, because they wanted us to fence our fields so they could tell, like, who was growing what in what area. And it was at that moment that I realized that people don't grow food the way that we grew food in Cochiti. We have no fences. Most of the fields are not squares. They kind of follow natural paths of water. And pests, like grasshoppers and elk, are constant guests in where we grow food, because, like, that's also part of their ecosystem.

Simran Sethi: A-dae says that the move back to grazing in ways like we've been talking about is a step in the right direction, but there is more work to be done. There has been a surprising lack of Indigenous voices in the national conversation about more sustainable ways to raise animals for food. That, despite their long history as original residents of these lands, and their deep knowledge of agriculture. For generations, the livelihood of indigenous people – their survival -- depended on sustainable practices.

A-dae Romero-Briones: We were committed to the land and the land is committed to us. And so, within that relationship, you had to operate within systems that survived, and that were healthy, and that regenerate. When you feel you're operating within a system that is being impacted negatively, you have to be able to respond to that. And so, it takes a certain kind of intelligence to recognize when that's happening.

(Music)

Simran Sethi: So here's the question: Do we have that intelligence? Are we going to meet this moment? There's never been a more urgent time to ask those questions. Changing the way we raise animals for meat is not enough, by itself, to solve the climate crisis. Nor is our meat consumption. But they are critical pieces of the solution.

(Music)

Simran Sethi: We'll have links for more information about our guests and the research we've talked about on our website, ways-and-means-show-dot-org. If you're enjoying this series, please leave a review for us, and tell your friends. This episode of Ways & Means was produced by Marc Maximov with Alison Jones and Carol Jackson. Thanks to Kirsten Khire. Our assistant producer is Akshay Gokul and our artist is Joy Liu. Johnny Vince Evans is our engineer. And I'm your host, Simran Sethi. Thanks for listening.

Advertisement: The Sanford School of Public Policy at Duke University offers masters programs with a focus on energy and the environment. Choose from a Master of Public Policy, Master of International Development Policy, or an International Master of Environmental Policy based at Duke Kunshan in China. A master's program with a focus on energy and the environment. Find out more at Sanford.duke.edu. Season 8 of Ways and Means is made possible thanks to support from the Office of the Provost at Duke University.