

# 2024 FOOD REVOLUTION SUMMIT

## Docuseries

### Episode 8

## The Future of Life on Earth

### *How To Be Part of the Solution With The Food On Your Plate*

Humanity is on a collision course with systemic environmental collapse. If we keep going on our current trajectory, we will run out of water, topsoil, and food for the generations to come. The good news is that it's not too late to make the changes we so urgently need. So, how can you take a stand and play a role in helping to turn the tide? In this riveting episode, we explore the consequences of our current food production systems - and powerful ways that you can make a massive impact for good. You'll be inspired by how you can contribute to sustainability, biodiversity, and soil health — and the power of the movements for natural, organic, fair trade, local, plant-based food to heal our lives and to heal our world. It's time for some grounded hope and real solutions that can make a world of difference.



## Contents

Some Inconvenient Truths	4
The Biggest Greenhouse Gas Contributor	6
Livestock's Long Shadow	8
Agricultural Land Usage	10
There's a Water Crisis	12
Is There Hope?	14
Agrochemicals	14
The Secret is in the Soil	15
Beans for Beef	17
Are Fish Part of the Answer?	18
Understanding the Impact of Our Food	19
Truths About Animal Agriculture	21
Less Suffering, More Kindness	22
Convincing Claims About Food	24
Buying Local	26
We Could Reverse the Damage	27
Tipping Points	31
A Plant-Based Solution	33
References	35

**Dr. Alan Desmond:** It's time for a Food Revolution.

**Dr. Shayla Toombs-Withers:** The Food Revolution is impactful.

**Dr. James Loomis:** The Food Revolution is transformative.

**Brenda Davis:** Compassion.

**Dr. Joel Fuhrman:** It's time for a Food Revolution.

**Dr. Vandana Shiva:** The Food Revolution is life.

**Dr. Steven Lome:** The future of medicine.

**Dr. Columbus Bastiste:** Long overdue.

**Dr. Susan Peirce Thompson:** It's time.

**Jennifer Paul-Quinn:** It's time.

**Andy Bellati:** It is time for a Food Revolution.

**Chef Babette:** The Food Revolution is our future.

**Dr. Neal Barnard:** It's power to change the world.

**Dr. Robynne Chutkan:** And it's available for everyone.

**Dr. Helen Powell-Stoddart:** It's time for a Food Revolution.

**Dr. Michael Greger:** It's time for a Food Revolution.

**Chef AJ:** Join the Food Revolution.

**Dr. Uma Naidoo:** Join the Food Revolution.

**Dr. Andrew Freeman:** Now is the time.

**John Robbins:** So far in this Summit, we've mainly focused on the connection between diet and health, and we've seen over and over again that what you eat can have a profound impact on how well and how long you live. When you give your body the right fuel, you will enjoy more vitality, more happiness, and a much lower risk of chronic disease, disability, and premature death.

**Ocean Robbins:** In this episode, we'll see that the benefits of a whole food plant-based diet, as wonderful as they are for human health, also extend far beyond the individual. We'll explore how

industrialized animal agriculture is fueling climate, chaos and mass extinction, polluting our soil and water and air, and making it more difficult to sustainably feed future generations. We'll look at the wider social and economic impacts of our food choices and we'll see how powerfully the same food choices that are best for human health also provide enormous benefits for the future of life on earth. I'm Ocean Robbins.

**John Robbins:** And I'm John Robbins.

**Ocean Robbins:** And you're watching the Food Revolution Summit.

**Dr. Scott Stoll:** Just like the human bodies that we see in front of us that are struggling under this burden of chronic disease, everything is struggling under the burden of chronic disease. The mismanagement of our world is that we have not stewarded the environment and the soil and the air and the water and the animals in the right way. We've exploited them for profit and we've exploited them for personal gain and now the price tag is coming due.

**John Robbins:** There are so many problems in our world that can feel overwhelming. Most people would like if they could to leave a better world for their grandchildren to inherit with less poverty, less war, less pollution, and more beauty and more compassion. And yet the sober reality is that in many ways right now, humanity seems to be on a collision course with systemic environmental collapse. Now in this episode, we're going to take an honest look at what we're up against. We're not going to sugarcoat anything because you deserve the truth, but we're also going to show you how powerful your food choices are to make you a part of the solution.

**Ocean Robbins:** As you'll see, the future of life on Earth is never so much in your hands as when you sit down to eat. Let's start with facing some inconvenient truths. Where are we headed? If we don't change course?

## Some Inconvenient Truths

**60 Minutes media clip:** The way we humans live on earth is sending it into a decline. Human beings have overrun the world. We are replacing the wild with the tame. Our planet is headed for disaster.

**John Robbins:** That was Sir David Attenborough. Many of us have loved the gorgeous films about the natural world that he and the BBC have brought to us over the years. What does it mean when a truly wise elder of such extraordinary gravitas and vast knowledge tells us our planet is headed for disaster?

**Ocean Robbins:** Sir David Attenborough has also given us a clue as to what we must do in his 2020 documentary film, David Attenborough: A Life on Our Planet. He advocates for people to stop eating meat or at the very least, to substantially reduce meat consumption. He tells us that if we want to save wildlife and the planet, we should go vegetarian because the planet can't support billions of meat eaters.

**John Robbins:** If we aren't going to whitewash and minimize to make what's happening today seem more palatable, then I think we need to take some very deep breaths and ask seriously, what is this disaster that Sir David Attenborough and others are warning us about?

**George Monbiot:** To put it crudely, very large parts of the planet are likely to be uninhabitable unless there is a very sharp change of direction. We are going to see billions of people left outside what is called the human climate niche. The parts of the world where humans can live even wider parts of the world is not going to be possible to grow crops. It's going to be either too hot for the crops, there won't be enough soil moisture. There'll be much more severe droughts and other shock events including cyclones, hurricanes, fire, all of which can be devastating to crops. And we will see with rising sea water and shrinking fresh water aquifers, the sucking of sea water into the ground, poisoning those aquifers and making it impossible to irrigate the crop.

And then on top of that, we have the soil erosion. On top of that, we have the collapse of marine food chains. On top of that, we have the potential collapse of massive earth systems like the Amazon rainforest, which gets eroded and eroded until it can no longer generate its own rainfall and flips suddenly into Savannah conditions and then changes climatic conditions right the way around the tropics. So all of these frightening converging forces are likely to materialize by the end of the century unless those of us who are alive and adults today change the system.

**Ocean Robbins:** That was George Monbiot. George is a British journalist and activist who's received dozens of awards including the prestigious United Nations Global 500 Award for outstanding environmental achievement, which was presented to him by Nelson Mandela. George was one of the early voices sounding the alarm about climate change, an alarm that has now grown into a worldwide chorus. Today, virtually every serious scientist on the planet is in

agreement that if we don't make major changes, we're headed towards a point of no return. And now these researchers are also telling us that if we're serious about stopping climate chaos, there is one factor that deserves far more attention.

**Media clip:** Climate and environmental scientists warned that we are fast approaching the point of no return if we don't make a substantial course reversal.

**Media clip:** We see really serious catastrophic effects in the next few years. Certainly in the next decade or two, the world will be completely different from the way it is now.

**Media clip:** Since 1900, we have seen a dramatic increase in worldwide weather-related disasters. There have now been four times more weather-related disasters in the last 50 years than in the previous 100.

**Media clip:** We began to work together to move this issue onto the global center stage. There was a lot of discussion about the contribution from buildings and from industrial factories, but I became aware during that same period of time that there was another factor that was going undiscussed and that is the role of animal and agriculture, which I could see was playing some significant role around the planet, but this was the elephant in the room no one wanted to talk about.

**Dr. Marion Nestle:** I think one of the deep dark secrets of the American agricultural system is that it is responsible for an astonishing level of greenhouse gas emissions, and this is something that I think people just have no idea about.

## **The Biggest Greenhouse Gas Contributor**

**George Monbiot:** Overwhelmingly, the major contributor to those problems is animal agriculture because it just takes a lot more to produce a given amount of calories from animals than it does from plants, a lot more land, a lot more crops if feeding them with crops or even more land if you're feeding them with grass because that's quite a land inefficient way of producing food. And so you have to occupy vast tracks of the planet which would otherwise support wild ecosystems.

**John Robbins:** Last year, researchers from the University of Oxford completed an extraordinary study that gives us the largest and most comprehensive look yet at the environmental costs of meat production.<sup>1</sup>

**Ocean Robbins:** They found that vegan diets are responsible for 75% fewer greenhouse gases than diets containing meat. And that vegan diets also result in 75% less land use, 54% less water use and 66% less biodiversity loss.

**John Robbins:** The benefits from a vegan diet are so enormous. The researchers added that even small changes in cutting down the amount of meat a person eats can make a huge difference for the earth and for all the life it holds.

**Dr. Neal Barnard:** Let's face it, the earth is changing. You just look at the thermometer any day, we are inching up more and more and more, and so we know that the greenhouse gases are having an effect. If anything, it's probably more rapid than scientists had predicted. There are a lot of drivers of this, but one of them is the fact that if you could take all the cows in North America, put 'em on one side of the scale, take all the people in North America, put them on the other side of the scale, the cows outweigh us dramatically.

The mass of cows is just huge and every single one of them is a belching methane creator comes out the front end and methane coming out of every animal in the feedlot, in the dairy industry and so forth. Methane is a dramatically powerful greenhouse gas, much more powerful than CO<sub>2</sub>. And so researchers have concluded a long time ago that while we're waiting to cap the smokestacks and we're waiting for people to drive electric and all the things that should all happen, you can change what you have for lunch. And as soon as you do, you become a methane fighting machine yourself.

**Dr. James Loomis:** When you look at climate change, for example, most people don't realize that animal husbandry, especially cows contributes more to global warming than all the transportation combined. And there's a combination of things. So cows, cows eat grass. Grass has cellulose in it, so they can't, which is hard to digest. So they've evolved a separate stomach called a rumen, which is full of bacteria that predigests break apart the cell walls, the cellulose so that they can get access to the protein and the nutrients in the grass. While the byproduct of that is methane. So methane and it gets emitted from both ends of the cow. We also have to grow the feed to feed the cattle. And so there's pesticides, there's herbicides. Those are typically petroleum-based. We have to till up the ground, we have to take the cows to slaughter.

The other thing people don't realize is most like you look at Amazon forest loss, most of that is driven by cattle.

And so when we tear down the Amazon forest, we lose the ability of that forest to capture carbon. And I think the numbers, it's like every hectare of forest captures about 30 tons of carbon, and when you cut that down, you lose that and it takes at least a generation to two generations to regrow that, to recapture that carbon after you replant the trees. So why are we cutting down the Amazon rainforest? Well, it's either to create grassland to graze the cattle or to grow cover crops to feed the cattle. And I mean you look at the other huge greenhouse gas, it's nitric oxide, right? So where does that come from? It's about 300 times greater. Greenhouse gas mainly comes from manure. And so you see these pictures of these huge, like the chicken houses and there's these big retaining ponds where they dump all the manure. I mean, the amount of two that escapes into the atmosphere is profound, and so people have no idea about the impact, the disassociation and that we haven't even started talking about like water use and land use.

**Dr. Marion Nestle:** The single biggest contributor to greenhouse gas emissions is beef animal food production in general has a higher impact on greenhouse gas emissions than does the production of vegetable foods. But beef far and away is the most serious contributor because rumen and animals have this unfortunate habit of burping methane. And if you have a lot of animals in one place, they're burping a lot of methane in one place.

**Dr. David Katz:** So beef is off the charts. Other animal foods are behind beef, but mammals invariably are high, poultry relative to plants. Basically, all animal foods have a higher environmental impact than plant foods. Overall mammals in particular.

## Livestock's Long Shadow

**John Robbins:** In 2006, the issue of climate change was becoming harder and harder to ignore. The link between climate change and fossil fuels was becoming more widely accepted and discussed, but somehow the meat industry had managed at least so far to dodge the spotlight. Scientists were aware that the methane produced by grazing cattle constituted a substantial portion of the greenhouse gases spewing into the atmosphere, but there had been no attempt yet to quantify how large a chunk that might be. In fact, the meat industry had been fighting long and hard to prevent just such an effort from being made.



**Ocean Robbins:** Yes, but then an intrepid group of researchers at the UN's Food and Agriculture Organization or FAO felt it was time to dig in. They knew they would face resistance from the FAO itself as well as from the meat industry. After all, the FAO had been founded in part to increase global livestock production. It was an organization that felt its mission was to represent the industry, not to scrutinize it.

**John Robbins:** But these researchers persevered even against very strong headwinds and they produced a seminal document called *Livestock's Long Shadow*. Their report concluded that livestock were responsible for 18% of all global greenhouse gas emissions and even larger contribution to climate chaos than the entire world's transportation sector, including all of the cars, the trucks and planes and ships and trains globally combined.<sup>2</sup>

**Ocean Robbins:** Now for their trouble, the researchers now tell us they were censored. They sabotaged, undermined and victimized. There were complaints from Big Meat that the FAO has fallen into the hands of vegan activists and there were personal threats such as, “the anti-livestock people are a pest that needs to be eradicated.”

**John Robbins:** When one scientist wanted to place Meatless Monday leaflets in the FAO cafeteria, she was told in no uncertain terms to remove and destroy them. And then the researchers were told by their bosses at the FAO basically to just shut up. Even if livestock contributes 18% to climate change, they were told the FAO will not say that it's not in the interest of the FAO to highlight environmental impacts.

**Ocean Robbins:** What followed from there was a concerted effort to undermine the message of *Livestock's Long Shadow*. When further research at the FAO found that livestock was a major contributor to climate chaos and the largest source of water pollution on the planet, that report never saw the light of day. It was completely buried.

**John Robbins:** Meanwhile, meat industry lobbyists continued to put pressure on senior FAO managers feeling the heat. The FAO leadership decided that hence forth its goal was to improve the image of the livestock sector accordingly. In 2013, the FAO produced a follow-up paper instead now of talking about *Livestock's Long Shadow*, the new paper was titled *Tackling Climate Change through Livestock* and it revised the 18% number downwards to 14.5% and then a year later, continuing in their commitment to downplay the role that livestock do play in climate change, the FAO found a way to again revise it downwards this time to only 11%.<sup>3</sup>

**Ocean Robbins:** But meanwhile, other teams of researchers and scientists had become interested in studying the topic. A study at Oxford University calculated that if animals were indeed taken off the menu, that one change would save \$30 trillion in health and environmental damage and an in-depth report by World Bank scientists, which was titled Livestock and Climate Change corrected errors in the FAOs reports and concluded that at least 51%, that's more than half of all greenhouse gas emissions should be attributed to animal agriculture.

**John Robbins:** So now we have the FAO subjected to extensive lobbying pressure telling us livestock are responsible for 11% of global climate change emissions and we have world bank scientists telling us the correct numbers. 51%, what's the truth?

**George Monbiot:** There's been a series of revelations about the lobbying pressure from the livestock industry, the meat industry bearing down on the food and agricultural organization and changing the results. That should never happen in science, but unfortunately, the science is taking second place to the politics here. There's a recent independent study which put it more like a quarter of all emissions, about 25%, but the truth is that we don't actually have enough science to be able to state definitively this is how much it's producing. Partly because of that industry pressure, it's cut off the funding sources for the research we need to do. But what we can say with confidence is that those food and agricultural organization figures just do not stand up because there've been deliberately watered down through political pressure and that's really outrageous. That's an insult to everyone. It insults our intelligence. It undermines our ability to solve our common problems.

## Agricultural Land Usage

**Ocean Robbins:** When that kind of industry pressure takes over an organization like the FAO, it really does undermine our ability to solve our common problems. There's a famous Woody Guthrie song, This Land is Made for You and Me, that might be poetically true, but it's not the reality today because now this land isn't for you or for meat, it's for the meat industry. Almost half of all America's land is used for meat, dairy and egg production around the world. More than a third of all habitable land on planet earth is used for livestock. Much of this land was once forest that was cut down to graze livestock or to grow feed for livestock.<sup>4</sup>

**John Robbins:** You might be asking, so what? Agriculture is land intensive and we need food. Well, that's true, but not all agriculture is equally land intensive. Meat heavy diets require vastly

more land to produce the same amount of protein than do diets with less or no meat. If we ate less meat and more plant-based foods, we'd free up a lot of land, which we could then use to make a huge dent in climate change.

**Ocean Robbins:** Yes, to avoid the worst effects of climate change, it won't be enough to only reduce the amount of greenhouse gases we spew into the air. Though of course we desperately need to do that, but we also need to remove these gases from the atmosphere and there is one known effective way to do that which doesn't rely on unproven carbon capture technology. The way we can remove these gases from the atmosphere is by rewilding. Rewilding is the term used to describe retiring agricultural lands so it can return to its original ecosystem so that its vegetation can sequester carbon dioxide, provide habitat for wildlife, protect biodiversity, and save species from extinction.

**John Robbins:** We could do all of that if we reduce our meat consumption, but currently that is not the direction we're headed.

**George Monbiot:** The livestock population is growing much faster than the human population, whereas livestock numbers are just growing and growing at 2.4%, which means of doubling every 30 years, and it's already the case that of the weight of mammals on Earth, just 4% are wild ones, 36% are human beings and 60% are livestock. And then that's going to double by soon after 2050 at this rate, then it'll just be 2% of the weight of mammals on earth being wild. It's a terrifying prospect. This is what's eating us out of house and home and just as importantly as leaving fossil fuels in the ground, we have to stop farming and eating animals.

**Media clip:** We are now over the line and the idea that we're going to double meat production between now and 2050, this is just unsustainable. This is going to have to give. Our diet is taking us to an abyss.

**Dr. Scott Stoll:** We're utilizing tremendous amount of our land to grow food for animals that only supply a small percent of the calories and protein that we need. 80% of the land is supplying 37% of the protein and 18% of the calories that we actually need. And so in the bread basket of the United States, we have these huge, amazing farms. I mean, they've had historically the richest soil and the greatest opportunity to provide living food for a living population. But because of subsidies and because of animal agriculture, they're utilizing the land to grow food to feed the animals.

And in the process, because of the way we're managing the soil without cover crops and the exposure and the evaporation, it requires large amounts of water. And so we have to water the crops in a changing environment with lots of evaporation and we're draining aquifers. So we have this triple threat of lower water eroding soil and disproportionate use of grain and soy and corn to feed animals that are not meeting the physiologic and caloric needs of a population. And so we've got a storm on the horizon that not many people are really thinking about.

**Media clip:** Our forests were once full of the most incredible life. In more recent years, we began to grow an insatiable appetite for meat and dairy. And as our demand for more meat grew, we needed more and more land. So we slashed and burned our way through the pristine forests, destroying everything in our paths to make way for the animals we desired to eat. As these animals weren't allowed to roam free as they naturally do in the wild, their grazing areas soon became empty. And so of course we needed to feed them. So again, we slashed and burned our way through more and more forests sewed the ground with genetically enhanced corn and soy and then downed it in pesticides, herbicides and synthetic chemical fertilizers.

**Leah Garces:** Cutting down of the rainforest its using of arable land is leading to major habitat destruction, which is the main source of biodiversity loss. And in my lifetime, the number of birds, amphibians, reptiles, and mammals has halved. The number of individuals has literally halved. And this should be on the top of the list of every government, every corporation, every official, looking at the impact of industrial animal agriculture on our sheer survival as a species, it is a emergency situation.

**John Robbins:** Leah just mentioned that in her lifetime, the number of birds, amphibians, reptiles, and mammals has halved. That evokes a lot of grief for me, and I agree with her that this really is an emergency kind of situation. In the US, scientists recently found that the population of monarch butterflies has fallen by 90% in the last 20 years, and the population of some types of bumblebees has dropped by 87% over the same period. If our goal was to drive as many species as possible to extinction, or if we just didn't care, then maybe, maybe then our current system of industrial meat production might make sense, but that is not the world I want to create, and I'm pretty sure it's not the world you want to create either.

## There's a Water Crisis

**Ocean Robbins:** No, we're here because we care and because we care, we also need the facts. So keeping up with our pledge to you not to sugarcoat what's happening, let's talk about another crisis that's brewing and then see what a world of difference our food choices can make. Let's talk about water.

**George Monbiot:** We're maxing out the use of fresh water and in many places, freshwater resources are beginning to fail and they will fail catastrophically in some parts of the world at current rates of use.

**Media clip:** A report published by WikiLeaks as far back as 2009 exposed the conversations between Nestle executives and US officials called the Tour the Horizon.<sup>5</sup> The Nestle executives said that their own research had shown that the world was set to run out of fresh water within the next 30 years. It stated that one of the greatest reasons for our detour down this catastrophic path is the global demand for meat products.

**Dr. James Loomis:** So if there's a draw in California, is the answer low flow shower heads and don't water your grass or is it don't eat hamburger? And we don't even have that dialogue and there's a lot of reasons. There's a lot of politics behind all that, but people have to start making the connection. I mean, the amount of embedded water in a cheeseburger, hamburgers like a thousand liters, right?

**John Robbins:** Of course, growing almost any kind of food requires water, but certain foods and dietary patterns have a much larger water footprint than others do. If the rest of the world ate the quantities of meat, eggs, and dairy products that Americans do, the planet would've run out of fresh water 15 years ago.

**Media clip:** A lot of people talk about how much fresh water we use for hydrofracking. 700 billion gallons globally is wasted on fracking. So 700 billion gallons sounds like a lot, but animal agriculture, the production of animals that we use for meat around the globe uses 70 trillion gallons of fresh water a year, hundreds of thousands of times as much as fracking. And we give the cows and the chickens the good stuff, right? They don't get the Flint, Michigan lead-tainted condoms floating in at water. They get the top-shelf stuff because we don't want to screw up our sausage links. And I know what some of you are thinking right now.

You're thinking, oh, here's the part, I'm a vegetarian and pigs are people too, man. But no, let's ignore how the animals are treated in our factory torture farming. Let's pretend they're treated amazing for just a minute. It's like a celebrity backstage at the Oscars. They're just being fawned

over and they get swag bags with free Apple watches. Point is, you should still be upset about this because animal agriculture is killing us and corporate media is fantastically pathetic on this topic. They never mention meat production. They never mention that a quarter-pounder takes 660 gallons of fresh water to create. That's the equivalent of showering for two months.

## Is There Hope?

**Ocean Robbins:** When a comedian tells us that the amount of water it takes to make one quarter-pound burger is equivalent to the amount of water it takes to shower for two months, we might wonder if that's accurate. Well, it is. What I want to ask you is, given all that we've been about here, is there anything that's happening now that gives you hope?

**John Robbins:** Well, yes there is. What gives me hope is that so many of us are looking for a way to turn things around and to make our world a better place. The very fact that we know so much about the trouble we're in is a result of enormous dedication from tens of thousands of devoted researchers. And another thing that gives me hope is what some of these researchers are discovering about what is possible as bad as things are, that's how much better they could be with the change. The benefits of eating fewer animal products and more whole plant foods can be measured in our arteries and in our aquifers and in our carbon emissions.

## Agrochemicals

**Ocean Robbins:** And it also matters and matters a great deal how we grow the plants that we eat. Currently, we use an enormous amount of agrochemicals such as pesticides and synthetic fertilizers.

**George Monbiot:** So you think fertilizer, what's wrong with fertilizer? It's good for plants, isn't it? Well, yeah, it's great for growing crops, but the trouble is that it fertilizes everything. The whole planet has been fertilized with the phosphate that we've dug up from the ground and with the nitrogen that we've turned sucked out of the air and intended to reactive nitrogen, which is a very different matter through industrial processes, a Haber-Bosch process.

And that has just flooded the planet with loads and loads of these active chemicals, which then stimulates plant growth in all sorts of places where you really do not want to be stimulating plant

growth like in rivers and in the oceans, and that creates blooms of single-celled algae, which can then kill the rest of life in those places. It's creating dead zones at sea, among other impacts. And the reason for that is that by day, the single-celled algae photosynthesize and produce oxygen, but at night they respire suck up the oxygen and produce carbon dioxide, and in doing so, they basically asphyxiate whole ecosystems and we see rivers dying.

We see oceans dying because of this over-fertilization, and we also see soil ecosystems being very severely damaged. In fact, if you apply too much nitrogen to the soil, you think, oh, we just slapped the fertilizer on and that's going to be great, but you can actually cause the entire soil structure to collapse and then plants stop growing in the soil. So it has a paradoxical effect. It's useful up to a point. You get beyond that point and suddenly you're causing more harm than good. And so we urgently need to get away from that. Similarly, with pesticides, I mean we call them pesticides as if the only things they kill are pests, but many of them are like broad-spectrum biocides.

They will kill many of the life forms they come into contact with and people say, look at the bees being killed. And yeah, it's a really frightening situation, but actually the bees are just like one set of species. If you look at what's happening in the soil as a result of pesticides, it's killing entire food chains and we're not even aware of that. We don't even think about it. No one's talking about the springtails and the mites and the nematodes and the other species in the soil being killed off, but they're absolutely essential. These are the species that build the soil.

## The Secret is in the Soil

**Media clip:** Can we feed the world without destroying it? The difference between death and life between extinction and abundance is the difference between dirt and soil. Just a handful of healthy soil contains more microorganisms than there are people on the planet. The entire food chain and our very existence is made possible by billions of tiny creatures coexisting right under our feet. Complexities of galactic proportions. Since the dawn of agriculture some 10,000 years ago, the simple act of tilling our land has been disruptive to fragile soil life, its ability to hold water and turning soil carbon into atmospheric carbon dioxide. With the invention of machinery and powerful new chemicals, industrial agriculture has exponentially exacerbated the issue.

**George Monbiot:** So this is a great challenge we face to feed the world without devouring the planet. I think the secret is in the soil. I think a much better understanding of the soil and the

complex relationships between plants, bacteria, fungi, and all the other organisms in the soil can help us to increase production or at least to maintain current levels of production without having to slap on all these chemicals. We've kept ourselves alive through soil chemistry, but the future, in the future, we'll keep ourselves alive through soil biology.

**Dr. Scott Stoll:** Soil is more complex maybe than even we can ever imagine or comprehend. Billions and billions of organisms in a single tablespoon of soil that have this incredible life connection with the plant that's growing and they're responsible for the phytochemicals and the plant that actually give us health. Going back to the most elemental aspect of growing food, the soil, we have tremendous problem today with soil erosion. We've lost at least 40% of our topsoil washing down the rivers into the ocean, and along with it all the chemical herbicides and pesticides that are creating dead zones in our ocean. Were just outside of the Gulf of Mexico where the Mississippi River enters the Gulf. There's a dead zone the size of New Jersey where there is no living life in the water.<sup>6</sup>

**Media clip:** Roughly 30 soccer fields worth of soil are lost every single minute. Today, 70% of our planet's soils have already been destroyed. At this rate, the earth runs out of farmable soil in a mere 60 years without soil, all ecosystems outside of our oceans become impossible. We can either wake up before it's too late or guarantee a path to consistent drought. Extreme food scarcity and catastrophic climate change is our only option, a system with a built-in expiration date or will we acknowledge our responsibility to this planet and uphold our debt to future generations?

**George Monbiot:** Soil is a biological structure. It's like a coral reef, and without the organisms that live in it, there is no soil. The soil disappears. So we urgently need to get away from this, and here's a real constraint. At the same time, we do need to keep food production levels high enough to support 8 billion people.

**Ocean Robbins:** So how do we feed 8 billion people without using chemical fertilizers and pesticides? Is it even possible?

**John Robbins:** Well, it's not possible if we continue eating as much meat as we've been doing, but it is absolutely possible if we make the change. Right now, the world's cattle consume a quantity of food equal to the caloric needs of nearly 9 billion people, which is more than the entire human population on earth. Wow. So when we cut down on our meat consumption, we can free up huge amounts of food and land, which can make it much easier to feed the world sustainably, organically and healthfully.



## Beans for Beef

**Ocean Robbins:** And even a simple swap like eating less beef and more beans can make a huge impact. Recently, Dr. Helen Harwick from Harvard University and a team of scientists she led calculated what would happen if every single American made the simple dietary change of just substituting beans for beef.<sup>7</sup> They found that if every American made that one change, the US could come very close to meeting its current greenhouse gas emission goals. Even if nothing about our energy infrastructure or transportation system changed at all.

**John Robbins:** That is just amazing and the benefits don't stop there. Even the FAO, the UN Food and Agriculture Organization, which as we've seen typically does the bidding of Big Meat, says that growing more beans, lentils and other legumes is one of the most powerful steps we can take to improve the health of the world's soils.

**Ocean Robbins:** Can you tell us, how does planting beans and other legumes help our soils?

**John Robbins:** It's because when beans and other legumes are grown as crops, they transfer nitrogen from the atmosphere into the soil, which completely eliminates any need for nitrogen fertilizers. And to me, this is beautiful. We have nutritionists telling us that legumes are excellent sources of protein and fiber and many essential minerals and phytochemicals. We have environmental scientists telling us that shifting from beef to beans is fabulous for the climate. And we have soil scientists telling us that legumes have a unique capacity to take nitrogen out of the air and draw it into the soil, which eliminates the need for farmers to use fossil fuel-based nitrogen fertilizers.

**Ocean Robbins:** And as well, we've learned from the study of the Blue Zones, which are those areas in the world where people live the longest and the healthiest lives, that there is one major thing that people living in all the various blue zones have in common, and that's that all of them eat a good amount of beans or other legumes. So beans, lentils and other legumes are part of the answer to the world's nutritional needs. They're part of the answer to the fertility of the world's soils and the part of how we can address climate change. That's huge. But while this is an important piece of the puzzle, it's not the whole puzzle.

**John Robbins:** No, no, not at all. We also need systemic change. If you think about it, the fossil fuel industry has been granted the greatest market subsidy ever, the privilege to dump its wastes into the atmosphere at no charge. I think we need policies that require polluters to pay

for the climate damage done by their products. Such policies would tilt the advantage to those forms of energy and those forms of food production that are not destroying our planet. There is absolutely no way we can solve climate change unless we greatly reduce our consumption of meat and unless we lower our reliance on pesticides and other chemicals in growing our food.

## Are Fish Part of the Answer?

**Ocean Robbins:** That is so true. Some people believe that fish is part of the answer. Let's take a look.

**Media clip:** Our oceans have also become filled with plastic. As the oceans are so large, it is a challenge for any scientist to accurately understand where most of this plastic is coming from. The great Pacific garbage patch covering an area of about 1.6 million square kilometers may provide a unique opportunity to better understand the growing problem of microplastics in the sea. A team of scientists from the organization, ocean cleanup, have been studying the patch for some time and were surprised when they discovered that the vast majority of plastic in the patch is not from old drinking straws or used plastic water bottles, but from thousands of tons of discarded fishing gear broken down by the sea into trillions of pieces of microplastic. A study recently published in the journal *Nature* found that about 80% of the plastic in the Pacific is made up of discarded fishing gear.<sup>8</sup> Many scientists agree that one of the greatest things we as individuals can do to solve this problem of a plastic ocean is to move away from eating fish and switch to a plant-based diet.

**John Robbins:** Microplankton are tiny ocean plants that are responsible for producing 80% of the world's oxygen. How are they faring with the amount of plastic now in our ocean waters?

**Media clip:** Microplankton are found throughout the oceans. They are filter feeders. When the researchers add microplastics into the plankton's environment, they consistently observe them ingesting the plastic articles, unaware that the tiny particles are made up of toxic chemicals. The plankton consumes them indiscriminately. The researchers observe how the chemicals accumulate within the organs of these small marine creatures. The toxic plankton are then eaten by larger fish, and researchers have found that much of the fish that we are eating today has bioaccumulated these chemicals within their flesh. A study by the University of Plymouth found that over a third of all the fish tested contained microplastics. As we eat these contaminated

fish, we ingest the same toxic chemicals into our bodies, and recent research suggests similar toxic accumulation in humans.

**Ocean Robbins:** As we've been running out of wild fish in the oceans, more and more of our fish are now coming from fish farms. Is this a good thing?

**Leah Garces:** Fish farming is becoming more and more popular as we deplete the oceans of wild fish. And wild fish has been overtaken globally by farmed fish. And farmed fish has a very negative impact on both the welfare of fish and on the environment for the fish they're living in these overcrowded aquaculture facilities lead to stress, disease outbreaks, poor water quality, impacting their overall welfare practices like selective breeding is pressuring them to grow very quickly, very fast, has led to genetic deformities and health problems. In fish. I think people think when they eat fish, they're just eating one fish. You're not eating one fish.

That one fish has been fed a lot of fish meal and fish oil derived from wild-caught fish. It's very inefficient as a deliverable of protein to us, and that contributes to further overfishing and pressure on the marine ecosystem. Excess feed and waste accumulate on the floor, the sea floor where fish pens are, and that leads to oxygen depletion, release of pollutants, harming more local marine habitats. And one of the scariest things I think is the escape, the escape of farmed fish, which leads to the genetic kind of contamination of wild populations and competition for resources. There's also antibiotic use and chemicals in aquaculture to try to control disease, which of course it's water so it doesn't stay there. It goes into the surrounding aquatic ecosystems. It affects human health. The water we're swimming in, the water we might be drinking, and it's just generally unsustainable and very cruel for the fish.

## Understanding the Impact of Our Food

**John Robbins:** I think it's critically important for us to understand the impact our way of producing food is having both on our well-being and on the health of ecosystems. But the meat and dairy and egg and fish industries have fought aggressively to ensure that the products they sell retain their foothold. In the modern diet, for example, they have successfully fought every effort to include the environmental impact of food production in the US Dietary Guidelines.

**Ocean Robbins:** One result is that the health researchers tasked with making recommendations for what to include in the dietary guidelines have been strictly forbidden from considering the

environmental impact of food. This separation of human health on the one hand, from planetary health on the other, is being imposed by the US government at the behest of these industries.

**John Robbins:** But now some courageous doctors are bucking the trend and emphasizing the importance of planetary health on the health of their patients.

**Dr. David Katz:** I feel very strongly that when we talk about diet for health, we have to be talking about the health of people and the health of the planet, and the health of the planet implies how we treat our fellow creatures. And frankly, I think it has implications for how we treat creatures both wild and domestic. You basically have three categories of consideration. How does what I eat affect me, just me, my health? How does what I eat affect what happens to my fellow creatures, domestic and wild? And how does what I eat affect the overall integrity of the planet and the environment in a way that's important?

Again for me, Chief Seattle, he said, we're all connected just like the blood that unites us. We don't weave the web of life. We're merely a strand in its whatever we do to the web we do to ourselves. And so there's this ancient wisdom that's been lost that we are all connected to everyone. We're connected to the earth and the soil and ecosystem that provides us food. We're connected to one another, we're connected to the air that we breathe.

**John Robbins:** We are all indeed connected to each other, to the earth, and also to the animals that draw breath from the same sources we do and that depend on the same soil and the same water as we do. There is something about our connection with animals that can open our hearts and deepen our humanity. Some people cry harder when their pets die than when they lose human family members.

**Ocean Robbins:** Yes, you don't have to be a vegetarian or an animal rights person to love animals and to appreciate the many wonderful ways that they can and do enrich our lives.

**Leah Garces:** Animals play this really, really vital role in our lives, and they offer us something that I think nothing else can in the world, which is this enriching experience where we get to foster deeper connections to the natural world, to other species and interactions with other animals, whether that be companion animals at home or wildlife, or even farmed animals in a sanctuary. They provide us with this emotional companionship they can provide us with stress release. They can also, in my case, provide me with a sense of purpose, either as a caretaker or an advocate for them. And I think these relationships offer really valuable opportunities above and beyond anything.

When we think of the wider world for empathy, for developing our compassion muscle and our empathy muscle, our understanding and respect other species muscle, it enhances our capacity for compassion and stewardship towards others, including our planet and our connections with animals. They remind us of truly our shared experience, this sort of intricate web of life ultimately, which enriches our existence, our human existence, and our humanity. I think overall, our relationship with animals is so vital because it just promotes this greater appreciation for beauty, for diversity, for connection.

## Truths About Animal Agriculture

**Dr. Michael Klaper:** I did a lot of my growing up on my uncle's dairy farm in northern Wisconsin in the 1950s. There were animals everywhere, and they're wonderful and magical from the frogs and salamanders in the pond to the hawks and birds flying around to the cows and the pigs that we had, and they're creatures, they're beings. And I can see the look in the cow's eyes, the purr the cat. They're experiencing their life just as intensely as I am experiencing mine. And I learned early on, I heard the cries of injured animals and heard the sounds as the bulls were being shot. And the mother cow mooing after her baby's been taken away from her, my uncle would take within a day of the calf being born, my uncle wants that milk, so he'd take the calf away and she'd be locked up bawling for hours. The most heart-wrenching soul-tearing moos go on hour after hour. This mother creature just had her baby taken away clearly was in distress, and it pulled at my heart. I just ate. I went crying to my mother. What is wrong with that cow? Well, that's just the way it is, dear, this dairy farm. And it was never really explained to me, but I can still feel that ache in that mother's heart and my own.

It comes down to suffering is suffering. If you're a sentient creature, you've got a nervous system, you can react to pain, you can suffer. And what right do we have to inflict suffering on anything, let alone any other creature? I don't want to inflict suffering on a redwood tree, let alone a kitten or a duck or a cow or any other animal. And I want to live a life of nonviolence. I want to go through this life with as smooth a wake left behind me as possible with as few ruffled feathers and as few suffering creatures inflicted as possible.

**Ocean Robbins:** It seems to me that our society's got a kind of odd relationship to animals. On the one hand, many of us love the animals that we call pets. We feed them, we pay their vet bills, and in many ways, we treat them like members of our families. We love them and they love

us back and that love really, really matters to us. But then we turn around and call other animals livestock. And by virtue of that semantic distinction, we feel entitled to treat those animals with any manner of cruelty as long as it lowers the price per pound.

**John Robbins:** Today, all 50 US states and most countries around the world have laws prohibiting cruelty to animals. And yet the animal protection legislation that exists in every single one of the 50 US states and in country after country around the globe specifically excludes animals destined for human consumption. The result is that animals raised for meat and dairy and eggs are routinely treated with a level of cruelty that if you did that to a dog or a cat, it could get you imprisoned.

**Andrew Binovi:** So if you were to put your dog or your cat in a gestation crate, you might be arrested, you might go to jail, you might be fined. But if you do that to a pig in your pod farm, well that is exempted from those laws. So nothing is going to happen to you. And that has been accepted, that's been internalized by the industry, and the industry fights tooth and nail to keep those cruel confinement systems in place. They literally lobby against just outlawing this practice. It's not outlawing the production of pork. It's not outlawing hog farms. It's just saying you need to not have this created in a way that the animal can't turn around, which seems pretty basic. Having an animal stand up and having an animal turn around, it's pretty basic. It's not really getting in the way of their farming, but they fight tooth and nail. They put a lot of money into making sure that those laws fail, and the industry has been very protective of that. But they're slowly losing that power.

**Dr. Michael Klaper:** And so what am I paying for in my purchases when at the restaurant in the supermarket? Am I causing suffering in my choices, in my purchases? And in this modern life? Yes, we are is the answer. There's a lot of animal suffering involved in the production of foods, but there's a lot we can do. We can make these choices to not choose those products that inflict suffering on other creatures. So yes, I'm a big fan of causing as little suffering as possible.

## Less Suffering, More Kindness

**John Robbins:** Most of us want a world with less suffering and more kindness. And in that light, the reality of modern factory farms can be painful to face. But occasionally miracles do happen.

**Ocean Robbins:** Yes, take Julia the pig for instance. She spent the first years of her life heavily confined in a factory farm. Her body was covered with scars inflicted by other traumatized pigs as well as by her human caretakers. But Julia was rescued and she was brought to an animal sanctuary. It took love and care to help her recover. But when she gave birth to her next litter of piglets, she was able to touch them with her love and walk them on green grass in the sun. As a family, Julia thrived in her new life and fortunately, her babies will never know the horrors that she escaped. They will live with dignity and love. Every single one of the billions of animals in factory farms has a face, knows love, feels pain, and is to some extent like Julia, also capable of healing.

**John Robbins:** There are many areas in our lives where we can feel powerless to truly make a difference. The problems of our times are so enormous that they can seem an awful lot bigger than any one of us. But when it comes to animals, we very literally carry their fates in our hands. If we eat meat that comes from a factory farm, we are virtually guaranteeing that more animals will live and die in those conditions. On the other hand, if we choose to support practices that are more aligned with our ethical sensibilities, we contribute to a more compassionate world. And for the animals whose lives are impacted, our choices can and do make all the difference.

**Ocean Robbins:** There are no animal that's more impacted by our food choices than chickens. Every year humans eat more than 70 billion of our feathered friends. Many of us have never really had the opportunity to know a chicken, but they can be remarkably kind and even adorable creatures.

**Leah Garces:** It's not a mistake that many children's books depict chickens taking care of their young, and in fact, they have the, this is how we know that chickens can experience empathy. It's through these observational experiments that have shown that a mother hen suffers when her chick suffers and they've done experiments to show when a chick is in distress, the mother is in distress too. And it shows that's an indication of capacity for empathy, which we sort of attribute only to humans or higher social species in the primate category. But chickens have that capacity. And as that makes sense to most people, if you take out the social constructs, of course, someone who is mothering and nurturing is going to have empathy skills. And that's a deep emotion that chickens can experience. And you can imagine what being capable of empathy feels when they're trapped in a factory farm full of flock mates that are suffering.

The typical egg farm will have animals kept in cages. So six to 10 depending on the size of a cage of laying hens are kept in so cages so small that they cannot spread their wings and they cannot turn around very easily without bumping into a flock mate. Not only that, laying hens are

genetically driven to want to lay their eggs in a nest. And so we are depriving them of this natural instinct. They become very frustrated and often with the space issues and the lack of ability to reach a nest or to perch, they will reach out to their neighbor and start pecking them. And so you have wounds and you have aggression, you have frustration, and as a result, you have very, very unhealthy unhappy animals. And this is the way still the majority of eggs are produced in the United States.

**John Robbins:** In some polls, more than 90% of us say the animals raised for meat should have a decent quality of life. But the industrialized food industry, for the most part, treats consumer conscience like a marketing issue. And that's why we have ag gag laws in many states that prohibit any photography in factory farms. And it's why we have pictures of happy chickens, clucking and sunshine drenched fields on packages of meat while inside is the flesh of a chicken that never saw the sun or a blade of grass in its life. And it's why we have all natural printed on labels for products that mother nature would find impossible to recognize.

## Convincing Claims About Food

**Ocean Robbins:** Organic and grass fed meats are better for the animals, and that really matters. But what about the claims that they're also better for the environment? Are those claims valid?

**Media clip:** Organic meat has been claimed to have less environmental and climate impact. However, a study carried out by researchers at Oxford University found that in fact, organic or conventionally produced meat has little significant difference in greenhouse emissions.

**Media clip:** So in our data, we didn't find big differences between organic and conventional across multiple indicators. What we did find is that no matter how you produce animal products, even the lowest impact forms of production still create higher emissions and use more land than typical vegetable proteins. So that's saying something really important. That's saying that even if you go into the shops and try and purchase sustainable meat, dairy is always going to be better to purchase vegetable proteins.

**George Monbiot:** Instead, if you're producing meat from grazing animals, it's actually even more damaging than producing meat from intensively fed animals. And it's by far and away the biggest contributor of greenhouse gas emissions from agriculture. In fact, animal agriculture



alone causes more greenhouse gas emissions in all the world's transport. It's second only to fossil fuels.

**John Robbins:** The idea that meat from grazing animals might be even more damaging to the planet than producing meat in factory farms can seem farfetched. And for fans of the belief that animals should see the sun and the grass and be able to move and live with a degree of dignity, it can also be disturbing. I would love to see factory farms and feedlots abolished because I think that that level of cruelty is an insult to the human-animal bond and is an ethical disgrace. But as cruel and as polluting as factory farms and feedlots are, they have mastered the signs of getting an animal to market weight as swiftly as possible.

**Ocean Robbins:** Cows raised in feedlots are slaughtered at around 16 months of age at a weight of about 1,350 pounds. Grass-fed cows, by contrast, are slaughtered at around 24 months of age, and they weigh only about 1,200 pounds.

**John Robbins:** So while grass-fed beef is definitely much kinder to the cattle, it's also a system in which cattle grow more slowly and are slaughtered at a lower weight, which means less meat is derived per animal. And since grazing animals gain weight much slower and take much longer to reach market weight all that additional time, they're continually emitting a very serious greenhouse gas methane.

**Ocean Robbins:** In methane, the greenhouse gas that cattle emit in their belches is potent over the course of 100 years. Methane's warming potential is 28 times higher than that of carbon dioxide. So every ton of methane emitted impacts the climate as much as 28 tons of carbon dioxide when measured in a shorter timeframe over the course of 20 years, methane's impact is even more dramatic, causing about 85 times more warming per ton than CO<sub>2</sub>.

**John Robbins:** And there's also the fact that about 80% of the grass-fed beef sold today in the US is imported. Most of it's from Australia or New Zealand, and some of it's from South America. This fact is hidden from US consumers because by law, when meat passes through a USDA-inspected plant, which is a requirement for all imported beef, it is then labeled as a product of the USA.

**Ocean Robbins:** Now, the beef industry likes to claim that cattle are grazed on lands where nothing else can grow anyway except grass. But the reality is very different than that. All around the world, forests and wetlands and woody savannas and other ecosystems have been cleared to make room for cattle to graze. When the Amazon rainforest is cut down to graze cattle, it

ceases to be habitat for native peoples, for animals, for all kinds of vegetation, and it ceases to be capable of absorbing carbon from the atmosphere.

**John Robbins:** So for all of these reasons, while grass-fed beef is more humane for the animals, it's often even worse than typical industrial beef for the climate.

**Ocean Robbins:** But leave it too big beef to try to fool you. So-called climate-friendly beef could soon land in a meat aisle near you. Tyson Foods has begun selling what it calls Climate Smart Beef complete with a USDA-approved Climate Friendly label. You might soon see it in your local supermarket, and it sounds really nice. We can continue to eat all the beef we want while the world burns, but don't fall for it. Independent scientists have called Tyson, so-called Climate Smart Beef, a classic example of greenwashing conveying the false impression that a company's products are environmentally sound. In fact, this is only the latest move in the meat industry's war against climate science. This is a part of its campaign to greenwash its way out of the fight for a livable planet.

**John Robbins:** Of course, there are of different ways to produce animal products, some of which are more humane and more sustainable than others, but there is no way around the basic laws of physics. When you move up the food chain, you create inefficiency. Animals don't just turn the calories they consume into food for humans. They turn their feet into hoofs and hides and bones and body heat and the energy to move around and of course manure. If we want a livable future for humanity, eating fewer animal products is a critical part of the equation.

## Buying Local

**Ocean Robbins:** Yes, it really is. Of course, there are other parts of the equation too. How important is it to buy food that's locally grown?

**George Monbiot:** There's a lot to be said for local economies. They can be more accountable, they can cut out the middleman, so you can have a direct relationship between producers and consumers. These are good things, but it's by no means a magic bullet to solve the problems of the food system. In fact, it can do exactly the opposite. So for example, I estimated that you would have to ship a kilo of dried beans 100 times around the planet before it had the same environmental impact as a kilo of beef produced in the field next door to your house. We have massively overestimated the impacts of transport and massively underestimated the impacts of

the kind of food we are eating, and it can often be a much greener option to be importing plant-based foods from around the world than eating animal-based foods at home. In fact, in almost all cases it is, there's an exception, which is food that is flowing and people assume that most of the imported food in their country is flowing in.

It's just not true. 0.16% of food is flown and a lot of that is fish and shellfish. There are some plant-based foods that have flown certain berries, for instance, green beans, sugar snaps, but they're very, very small proportion. The great majority is shipped and trucked and the impacts are much, much lower that way. Shipping in particular has become super efficient now, and obviously it'd be lovely if we could all grow our own food and do everything locally, but we simply can't. There was a study published in *Nature Food* saying, what's the minimum distance over which the world's people can be fed?<sup>9</sup> And the average minimum distance is 2,200 kilometers, about 1300 miles. And the reason for that is that a lot of us live in very densely populated places where there's just not a big enough agricultural hinterland to feed us. So we do depend on food being moved around the world.

And in fact, one of the reasons why we suffer so much less famine and starvation today is because of that global transport of food. Of course, it has downsides, so plenty of downsides to that, and in a way we've become overdependent on it, particularly as so much of that trade is now controlled by large corporations. One estimate suggests that four corporations control 90% of the global grain trade. That's a very dangerous situation indeed, but we can do it better. We're always going to be dependent on the movement of food to some extent, but we can do that better and we can break the stranglehold of those corporations. In fact, we must do. Again, it's another existential risk because when corporate power becomes over-dominant, the system can fail just like it did with the financial sector in 2008, which was rescued at the last minute by governments printing future money, issuing future money in the form of quantitative easing. Well, if the food system fails, you can't print future food.

## We Could Reverse the Damage

**Ocean Robbins:** It's a staggering fact that currently around the world, livestock are using out more than 80% of the world's agricultural land to produce just 18% of the world's calories. So if just theoretically the whole world went vegan tomorrow, we would instantly free up an area of land equivalent to the entire area. The entire landmass of the United States, European Union, China and Australia combined.

**John Robbins:** Much of this land was once forest that since has been cut down to graze livestock and to grow the corn and the soy that we feed to them. But if we ate less meat, much of that land could be forested or rewild, which would provide habitat for countless species, many of whom are endangered and would otherwise go extinct. And it would also draw down immense amounts of carbon out of the atmosphere.

According to a study published in the journal *Science*, if the entire world were to switch to an exclusively plant-based diet, we would free up over 75% of the world's arable land and many of the forests previously cut down for livestock farming could be restored.<sup>10</sup>

**George Monbiot:** Well, for a start, we would release about three-quarters of the world's farmland for rewilding. And I think now that rewilding is our only hope. It's the last hope we have. The mass restoration of ecosystems bringing back the forest, bringing back the wetlands, bringing back savannas, the wild grasslands, all of which are much richer in wildlife and much richer in carbon than farmed landscapes that rewilding would draw down much of the carbon we've already released into the atmosphere. We also obviously have to severely and rapidly decarbonize our economies at the same. It's not enough by itself, but the two things together could get us there and could allow ecosystems to bound back. And if they do so, then we really could prevent the collapse of earth systems.

But if we don't do that, it's really hard to see how that's going to happen. And so that's why I think that ending animal agriculture is right up there with leaving fossil fuels in the ground because of that enormous potential for restoring the planet, which we would have if we did that. It would also mean that the direct greenhouse gas emissions from agriculture would fall by about three quarters. So you're saving land, you're saving greenhouse gases, you're saving soil, you're saving water. I mean, everything gets easier in environmental terms. If we switch to a plant-based diet.

**John Robbins:** It's really remarkable how much does get better. When we shift towards a plant-based diet, it takes so much less land and so much less water to feed ourselves that way.

**Ocean Robbins:** And one of the benefits of freeing up all that land is that we can focus our agricultural practices less on short-term yield maximization and more on long-term sustainability on agricultural practices that sequester carbon out of the atmosphere and that improve the long-term fertility of our soil.

**John Robbins:** Our current agricultural system is designed to produce enormous yields of corn and soy and other crops so that we can waste most of the calories by cycling them through livestock. This has brought us pesticide-dependent monocultures, but something very different is possible.

**Dr. Vandana Shiva:** No ecological system works in monocultures. It always works in diversity and no ecological system works by just taking an extraction. They all work by giving back and recycling. So those two principles are everywhere. The more biodiversity you have, the more nutrition per acre you have, the more biodiversity you have, the more availability of organic matter. You have to be able to give back to the soil and other species. With that, your cycle of production increases your systems that actually produce the nutrition and food. They become more populated in your ecosystem and you are able to grow more food. You're able to grow more food by sharing your work with the earthworms and the RIS fungi. Our research in Navdanya Farm is shown that A, we have six times more pollinators on our farm than in the forest next door, so that farming does not have to destroy nature. But we then did actually control experiments on how much do the pollinators contribute to our food production. One third of the food we eat comes from pollinators. So if you don't spray pesticides, you're actually growing more food because you're letting the pollinators work.

**Media clip:** Over the last century, our farmers have been encouraged to rely on unsustainable synthetic inputs gaining short-term boost in production at a major cost to soil longevity. When combined with monocropping and repeated tilling, biodiversity is all but eliminated eventually leaving nothing but debt dirt. This degradation accelerates erosion as lifeless dust is blown away and washed downstream in the US, we're losing soil 10 times faster than it could be naturally replenished. However, in the longest study of its kind after more than 30 years or organic agriculture has proven to match or surpass conventional yields emitting 35% fewer. Greenhouse gases use 45% less energy and build soil rather than deplete it.

Studies show that the more soil health is holistically managed, the more food is actually grown. A strategy called no-till farming minimally disturbs fragile soil microbes. While cover crops are year-long plants that shield the ground rather than leaving it exposed to the elements. No-till cover crops and composting all help retain water and generate more carbon-rich soil. Every year these methods increase humic substances. One of the most important indicators of healthy soil humic substances are a critical component of decomposing organic matter, supporting the flow of essential plant nutrients and soil structure.

A healthy tablespoon of soil contains an astonishing 6 billion microorganisms, tens of thousands of different species each playing a vital role in the cosmic microbial ecosystem. Fungal mycelium networks act like a vast underground internet transporting nutrients, water, carbon, and creating a stable structure that prevents erosion. With only a 1% increase of organic matter, soils hold an additional 25,000 gallons of water per acre reducing the risk of both drought and flood. When plants absorb CO<sub>2</sub>, carbon is fed to microbes through the roots as a storage container for what was once atmospheric carbon, enough healthy soil could offset virtually all greenhouse gases on the planet. These principles working in harmony are known as regenerative agriculture. By creating a more resilient and nutrient-dense food system, regenerative agriculture can not only feed the world, but maybe the planet's only hope to actively reverse climate change like nothing else. Increasing the health of our soils simultaneously addresses nearly all other environmental issues.

**Dr. Vandana Shiva:** We all must think of ourselves as gardeners and farmers. A good farmer is like a gardener and all of us should be gardening. All of us should be farming. And if you can't because of the situation you're in, know the farmer who's growing your food, get to know them.

**John Robbins:** We are currently enmeshed in a food system in which the cost of organic food and the cost of fresh fruits and vegetables, in general, are very high, while the cost of junk food and industrial meat products are artificially low.

**Ocean Robbins:** There's nothing about processing Mother Nature's bounty in a factory stripping of its fiber and vitamins and minerals, wrapping it in a bunch of plastic, shipping it thousands of miles all around the world, and then spending millions of dollars advertising it on television. That inherently makes it cheaper than real local natural food. But we've got governments and food policies that effectively subsidize the mass production of junk food and factory-farmed animal products.

**Media clip:** Each year, the US government gives around \$20 billion to subsidize fruit and vegetable farming, but meat and dairy farming get a massive \$38 billion from the government. It is now estimated that the annual cost to the US taxpayer of diseases related to meat and dairy consumption are now around 314 billion.

**Andrew Binovi:** We can most definitely save money for taxpayers in the long run, and we are saving money when it comes to healthcare costs by making our food system better for people's health. That means that they're not spending money down the road and it means the government is not spending money through Medicare or Medicaid. That means that those

diet-related diseases that we're seeing a rise of right now are going to decrease. Why not make a change now? Why not focus more on plant-based sources? Why not we get rid of all these subsidies that's making this cheap for people and taking a look at food that works better for them?

## Tipping Points

**John Robbins:** We hear a lot about tipping points when it comes to climate chaos. We hear about the potential collapse of huge ice sheets in Greenland. We hear about the widespread thawing of permafrost and the death of coral reefs in warm waters and the collapse of atmospheric circulation in the North Atlantic. Those are all frightening tipping points, and they are all real.

**Ocean Robbins:** Yes, but just as real are the tipping points that could occur in the other direction. If we're able to shift as a people to a more whole foods plant-based diet, the consequences would be far-reaching and they'd be beautiful.

**John Robbins:** They would be positive. Tipping points are not only possible, they would be extremely consequential. A report from the World Resources Institute found that moving away from animal products would slash billions of tons of carbon emissions. And a study from the University of Oxford found that moving toward a plant-based diet would cut food-related gas emissions by more than two-thirds and would have a value to the global economy of a trillion dollars each year.<sup>11</sup>

**George Monbiot:** So I do have hope because I recognize that society is another complex system. All the things that are important to us really are complex systems. The human brain is a complex system. The human body is a complex system. The food system is a complex system, the financial system, every ecosystem, the oceans, the atmosphere, the cryosphere, they're all complex systems. The soil is a complex system, but human society is also a complex system. And complex systems have tipping points. They all have tipping points, and that applies to human society just as it applies to all others, and they can tip in a very positive direction. When it comes to social tipping points.

**Dr. James Loomis:** I mean, it is just incredible. And the power of a plant-based diet to make one relatively, maybe not easy but simple change in your lifestyle can have such a powerful impact

on your athletic performance, on your health and the environment. And it's compassionate for other living creatures. And I mean, I never even thought about all that. I came into it through my health, but the more and more I've learned about the other aspects of the benefits of plants, it is astounding.

**Andrew Binovi:** Really. Luckily, I get to talk to people about this a lot, and I say it's like a win, win, win win. I think it's a win for people. It's a win for business, it's a win for the environment. It's a win for animals. So you can make this in a way that is beneficial for all of this. You can talk about moving factory farms away from that, away from animal agriculture and towards food that people should be eating like lentils, like beans. You can talk about the way that this can be better for people and for their health. You can talk about how it's better for the environment and you can talk about how it's better for the animals getting them out of confinement. I don't see where the downside is on that.

**Dr. Michael Klaper:** If we stop eating animals, we wouldn't need all this land to grow. The feed corn in the grazing area and the trees that were used to be there, they would start coming back. The forest will recede itself, and as the trees grow, they take carbon dioxide out of the air and turn it into solid wood. They are the ultimate carbon sequestration device that Mother Nature's come up with. All we need to do is just evolve to a plant-based diet and let the forest come back and everything will get better. The soils will stabilize, the rivers will run clean again. The global warming will reverse.

The manure will disappear from the streams, et cetera. The planet will heal and so will we. You would know that all the kids are growing up with healthy arteries. You would know that the animal suffering has stopped. You would know that the earth's ecosystems are healing, that the waters are running clearer. There'd be a sense of optimism and of upward growth in a good way. And the idea of the consumer society would give way to the idea of the caretaker society that we're here to have. We're tenders of the garden here. We're not exploiters. We have dominion over the animals. Dominion comes from the word domicile. It's your house and all these creatures are in our houses, and it's up to us to care for them. So it's a future of caring, compassion, growth, and love.

## A Plant-Based Solution



**John Robbins:** So here we are, we're faced with huge problems like climate change and the extinction of species and people who are suffering enormously under the burden of chronic disease. But there are answers. There are steps we can take personally and collectively to move toward a brighter and healthier future. A whole foods plant-strong diet has enormous power to provide solutions to so many of the biggest challenges of our times and often in dramatic ways.

**Ocean Robbins:** Wherever you come from, whatever your background, we're all living at a pivotal moment right now by being here and being part of this Food Revolution, you're part of a global uprising at people who are helping reverse the chronic disease nightmare. That's become the norm in the industrialized world. You're part of a surging movement of people who are standing every day with their food and their life choices for greater health, greater self-reliance, and for a healthier planet.

**Dr. James Loomis:** It's astounding to me that just one simple change in lifestyle going on a plant-based diet can have such a profound effect not only on the compassion we have for other creatures, but also our health and the environment and athletic performance.

**Dr. Scott Stoll:** I believe that the earth is much like a human body, that if we give it the opportunity to heal and the resources it needs, it will rebound maybe even faster than we imagine. Hippocrates said this, he said healing is not just a matter of time, but also opportunity. I believe that if we can through our dollars, begin voting with the food that we're purchasing to fill our plate with regenerative food that regenerates every element of that ecosystem, we will see that we're giving the earth the opportunity. It will rebound maybe even faster than we can imagine. And this is a very hopeful and inspiring message that we need to share with as many people as possible. Because the more people that begin to shift that plate, the more downstream and upstream we will see this transformation of our world.

**John Robbins:** What I love about the Food Revolution is that it's positive, it's practical, and it can make a real difference. It's true, we're facing some huge, even overwhelming problems, but the food revolution gives every single one of us an opportunity to make a real difference for our personal lives and for our planet every single day.

**Ocean Robbins:** Everybody needs to eat in order to live. And when you eat more real, whole plant-based foods, you're taking a powerful stand for your wellness. You're contributing to a world with fewer animals being tortured in factory farms, less erosion of our top soil, less depletion of our groundwater, and to a more stable climate. You're helping to create a world that

will be healthier and more beautiful for future generations. So to me, the Food Revolution is an opportunity to move from apathy and despair to grounded hope and positive action.

**John Robbins:** Sometimes I look out into the world and I see a deep night of unthinkable, cruelty and blindness, but I can also look within the human heart and find something of love there, something that cares and shines out into the dark universe like a bright beacon. And it is in the shining of that light. Within that, I feel the dreams and the prayers of all beings in the shining of that beacon. I feel all our hopes for a better future.

**Ocean Robbins:** The next time anyone tells you that who you are doesn't matter, or that your actions and love are insignificant, here's what they need to know. Every one of us who takes a stand with our lives on behalf of what we cherish is part of something vast. The longing for our world, guided by love is as old as the human heart.

**John Robbins:** And now I'd like to end this summit docuseries with a prayer. It's a prayer with which I've ended each of our 12 previous summits and all of the books I've written. It's a simple prayer, may all be fed, may all be healed, may all be loved.

**Ocean Robbins:** May all be fed, may all be healed, may all be loved. This is Ocean Robbins.

**John Robbins:** And John Robbins

**Ocean Robbins:** Thanking you for being with us and wishing you as much healing and joy and peace as possible for you, for those you love and for our vulnerable and beautiful world.

## References

1. Clark M, Springmann M, Rayner M, et al. Estimating the environmental impacts of 57,000 food products. *Proc Natl Acad Sci U S A*. 2022;119(33):e2120584119. doi:10.1073/pnas.2120584119
2. Livestock's Long Shadow. Food and Agriculture Organization of the United Nations. Rome, 2006. Available from: <https://www.fao.org/3/a0701e/a0701e00.htm>
3. Tackling Climate Change Through Livestock. A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations. Rome, 2013. Available from: <https://www.fao.org/3/i3437e/i3437e.pdf>
4. Bland A. Is the Livestock Industry Destroying the Planet? *Smithsonian Magazine*. Published 1 Aug 2012. Available from: <https://www.smithsonianmag.com/travel/is-the-livestock-industry-destroying-the-planet-11308007/>
5. TOUR D'HORIZON WITH NESTLE: FORGET THE GLOBAL FINANCIAL CRISIS, THE WORLD IS RUNNING OUT OF FRESH WATER. WikiLeaks. 24 March 2009. Available from: [https://www.wikileaks.org/plusd/cables/09BERN129\\_a.html](https://www.wikileaks.org/plusd/cables/09BERN129_a.html)
6. Gulf of Mexico 'dead zone' is the largest ever measured. NOAA. Published 2 Aug 2017. Available from: <https://www.noaa.gov/media-release/gulf-of-mexico-dead-zone-is-largest-ever-measured>
7. Research suggests eating beans instead of beef would sharply reduce greenhouse gasses. Loma Linda University. Available from: <https://news.llu.edu/for-journalists/press-releases/research-suggests-eating-beans-instead-of-beef-would-sharply-reduce-greenhouse-gasses>
8. Lebreton, L., Slat, B., Ferrari, F. et al. Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic. *Sci Rep* 8, 4666 (2018). <https://doi.org/10.1038/s41598-018-22939-w>
9. Monbiot G. The secret world beneath our feet is mind-blowing – and the key to our planet's future. *The Guardian*. Published 7 May 2022. Available from: <https://www.theguardian.com/environment/2022/may/07/secret-world-beneath-our-feet-mind-blowing-key-to-planets-future>
10. Ritchie H. If the world adopted a plant-based diet, we would reduce global agricultural land use from 4 to 1 billion hectares. *Our World in Data*. Published 4 March 2021. Available from: <https://ourworldindata.org/land-use-diets>

11. Plant-based diets could save millions of lives and dramatically cut greenhouse gas emissions. University of Oxford. Published 21 March 2016. Available from: <https://www.oxfordmartin.ox.ac.uk/news/201603-plant-based-diets/>