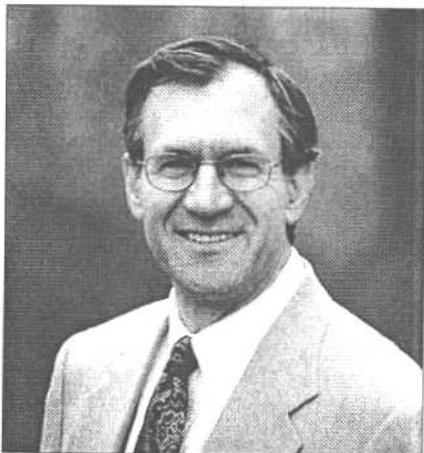


# Failure to Protect the People

Advocate, Author Steven Druker Explores the Uncontrolled Experiment of GMOs in Our Food Supply



*What are genetically engineered foods doing to us? The most chilling thing about the decades-long uncontrolled experiment in mass consumption of food disrupted at the cellular level is that we cannot know – that’s why the term “uncontrolled experiment” is actually an oxymoron. The “massive enterprise to reconfigure the genetic core of the world’s food supply,” as attorney and activist Steven Druker describes it, amounts to a train wreck of historically unprecedented proportions. Law, ethics and science lie smoldering on the tracks while hundreds of scientists and journalists who ought to know better contribute tirelessly to what may be the greatest disinformation campaign since Edward Bernays invented public relations almost a century ago.*

*As the man whose lawsuit against the FDA at the end of the '90s shook loose piles of incriminating documents, Steven Druker plays a crucial role in the fight against this great mistake. His new book, *Altered Genes, Twisted Truth*, combines the genres of memoir, policy paper, legal history and scientific primer to arrive at something like a definitive account of the GMO wars. As he recalls, policy warrior was a role history thrust upon him. Druker majored in philosophy at the University of California at Berkeley, where he received a special award for Outstanding Accomplishment and went on to earn his Juris Doctor from U.C. Berkeley. He was elected to both the Law Review and the legal honor society. Not too many years later, biotechnology intervened, and nothing was ever the same.*

## Steven Druker

**ACRES U.S.A.** This book comes at the end of a long road for you. Where did it begin?

**STEVEN DRUKER.** When I learned about the venture to reconfigure the genetic core of the world’s food supply back in the fall of '95, I was surprised. I hadn’t really been paying attention to the whole controversy on genetic engineering even after it moved into agriculture. As I began my research in early 1996, I did something few Americans were then doing. Most Americans were not getting any facts about genetically engineered

foods. If they knew about it at all, all they were getting were the standard kind of promotional claims, and I wanted to find out what was happening. The more I learned, the more I became concerned because it became very quickly evident that there was a great gap between the promotional claims and the realities. As I learned more, being a lawyer, I felt there should be a lawsuit against the FDA. That would be a good place to start, but I didn’t want to do it since I was involved in another important project and didn’t have the background. In trying to inspire public interest groups

*Interviewed by Chris Walters*

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“Once genetic engineering did expand into agriculture, the range, the amount and the intensity of disinformation also had to expand, and year after year it got worse.”

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to do it, everybody with whom I spoke thought it was a great idea but nobody was ready to have their organization do it. Eventually it became clear that if I didn't do it, it probably wasn't going to happen, so I put my project on hold, founded the Alliance for Bio-Integrity, and embarked on what I thought would be maybe a one or two-year project. Here we are 19 years later, and it's my full-time focus.

**ACRES U.S.A.** When did it become clear to you that the FDA had violated federal law?

**DRUKER.** Initially I just had a hunch something was wrong. It seemed very wrong that there were no labels. It was also clear that the FDA had a promotional role and yet they were supposed to regulate these foods. That raises reasonable doubts, because has it ever been the case that a federal regulatory agency can both ardently promote a product and also rigorously and fairly regulate it? I think almost everybody knows that given such a conflict of interest, something is going to lose out. There was enough evidence to distrust what the FDA was saying in terms of its pronouncements that these foods were safe. The FDA wasn't requiring any tests even though they were trying to give the impression they were. I learned enough to realize that these foods were being presumed safe. I had a hunch some laws were being broken in terms of labeling and perhaps in terms of food safety. As I did more research and began to develop some expertise in U.S. food safety law, it became evident that the law was being broken. By having nine well-credentialed life scientists as plaintiffs, which was unprecedented, that in itself demonstrated that the FDA's purported legal basis for these foods being on the market was fallacious – the claim that

there was an overwhelming consensus within the scientific community – because there isn't. I knew there were hundreds of independent scientists who did not regard these foods as safe and didn't think that they had been demonstrated safe yet. It took a bit of effort to get scientists who felt that way to actually take the bold step of signing on as plaintiffs in the lawsuit. They had to be U.S. citizens, and also they had to have university tenure because it would be too risky for non-tenured faculty to do it. Some of the scientists who wanted to do it realized they would probably lose their federal grant money since the federal government is promoting these foods, they wouldn't be able to get any more grant applications approved. The fact that we had nine was significant – nine scientists stating that they had seen no published research demonstrating that even one of these genetically engineered foods was safe.

**ACRES U.S.A.** What was the lawsuit able to dislodge in terms of discovery from the FDA?

**DRUKER.** That was the major thing the lawsuit accomplished, and we accomplished it fairly soon. The FDA was forced to hand over all of the internal files relevant to its policy on genetically engineered foods. We got over 44,000 pages of documents, and as I went through them I compiled extensive evidence that the FDA had been lying and breaking the law. The FDA's own scientists had been asked to conduct an extensive examination of genetically engineered foods. They overwhelmingly concluded that genetic engineering is different from conventional breeding. It entails unique risks, and each of the gene-altered foods has to be carefully tested before it should be allowed on the market. By the way, that's the law any-

way. The FDA scientists were merely saying that what the law requires was scientifically sound. They were saying that we can't presume these foods are safe, and they have to be carefully tested. Because that was not what the FDA decision-makers wanted to hear, they covered all of that up and lied to the public when they released the agency's policy on genetically engineered foods in May 1992. They stated that the agency was not aware of any information showing that foods produced by these new methods differ from other foods in any meaningful or uniform way. That's a very close paraphrase, and it's an outright lie. The FDA's files had a lot of information from their own scientists explaining why there were differences and why these foods couldn't be presumed safe. The FDA's biotechnology coordinator even admitted in a letter to Canadian health officials in October 1991 that there wasn't a scientific consensus, and yet in May 1992 they claimed there was. A consensus didn't develop that quickly. The law requires any consensus to be based upon technical evidence, and the FDA's files admitted they didn't have technical evidence of safety.

**ACRES U.S.A.** Your account implies that even by the late '70s and early '80s the biotech sector had laid down a sizable bed of cash and propaganda. It succeeded in ginning up a gold rush fever among scientists at a time when even well-informed Americans barely knew this stuff existed.

**DRUKER.** What you've said is an accurate representation. It wasn't until about 1982 that the first genetically engineered plant was successfully created, and that wasn't an agricultural plant. Even in the early years of genetic engineering, when single-celled organisms were the only GMOs, the scientific establishment laid a groundwork of disinformation to prevent significant regulation from being put in place and to shift the burden of proof. The massive amounts of money that had to be committed to develop genetically engineered agricultural plants probably wouldn't have been committed at all if there had been strong regulation of bio-

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technology in place and if the general risks of recombinant DNA technology had been known. Had it been known how unpredictable and how prone to unintended side effects it could be, these food organisms would've had to be carefully tested. Without that disinformation put around even before there was an ag-biotech industry, we wouldn't have seen genetically engineered foods developed, let alone commercialized. I think that's a fair statement. Once genetic engineering did expand into agriculture, the range, the amount and the intensity of disinformation also had to expand, and year after year it got worse.

**ACRES U.S.A.** Were Reagan administration officials instrumental in setting the terms for this policy that wasn't founded on evidence?

**DRUKER.** Yes, the crucial groundwork for the United States' regulatory governmental policy on genetic engineering was laid during the administration of Ronald Reagan. Of course, that administration, as we know, had a philosophy of wanting to reduce regulations to the bare mini-

mum anyway, which dovetailed with the desires of the biotech promoters to avoid regulations. Even so, and even before Reagan was in office, the biotech industry had to misrepresent many facts to avoid regulation. It was during Reagan's presidency that the joint coordinated framework was developed, which set the basic guidelines for how genetic engineering and genetically engineered foods would be treated by the federal government. It wasn't based on sound science. It was based primarily on economic and political considerations. However, even though Reagan said "no new regulations," there were already regulations in place that formed a bulwark against allowing genetically engineered foods on the market without thorough safety testing. Since 1958, U.S. Food Safety law has included a strong precautionary principle in the case of new food additives. So according to the existing law, these genetically engineered foods had to be demonstrated safe. The people advising Reagan probably did not know that at all, but the people at the FDA did. Within FDA documents we can see them grappling with the facts of what the law is and the pressure they are under to release the new food products and pretend there's somehow no need for testing. What was decided was that they would claim the engineered foods were generally recognized as safe and make any testing voluntary. They decided to project the illusion that they were really engaged in regulating the industry, when in effect they were not regulating it one bit. There's still not one iota of mandatory regulation of the genetically engineered food industry imposed by the U.S. FDA. By law the agency should be regulating, but in practice nobody even has to inform the FDA if they're going to dump a genetically engineered food product on our market, let alone do any testing. Everything the FDA has done with its voluntary consultation program is all window dressing. It is smoke and mirrors intended to give the impression that there is something responsible going

on when in reality there is no scientific review at all. The FDA's biotechnology coordinator admitted as much in one of his more candid moments. That's on record. Yet most of the time they try to claim they are doing a thorough review. Accordingly, most people have been confused. Most people think the FDA is regulating these foods. Most people think we lack strong laws to require testing of GMOs and that the European Union is the one with the stronger laws, and that's why they don't have GMOs on their market. In truth, the United States has the strictest food safety laws when it comes to GMOs; they're just not being enforced. In fact, they're being violated, and that's why we have GMOs on our market.

**ACRES U.S.A.** One thing you mentioned earlier struck an odd note. Many people who follow this issue might be surprised to learn that the FDA acted as a promoter of this technology before it was actually viable. That is intriguing.

**DRUKER.** My book cites one of the FDA's own documents from the '90s that admitted the agency had an agenda to promote biotechnology – that's in writing!

**ACRES U.S.A.** A major protagonist of your book is a man called Phil Regal. Who is he, and why is he important?

**DRUKER.** Phil Regal retired a few years ago but for many years was a professor in the College of Biological Sciences at the University of Minnesota. He was very well regarded, very well published in several fields, quite a polymath. He understood biology holistically from the organismic standpoint, from the ecosystem standpoint – he was a great generalist. He began to be concerned about genetic engineering back in the early 1980s, and it wasn't just him. Among the other scientists with concerns was Ernst Mayr, one of the greatest biologists of the 20th century, and then a professor at Harvard. He

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and Regal talked about the kinds of risks genetic engineering entailed. At that point there were no genetically engineered foods – they were concerned primarily with the risks of releasing genetically engineered organisms, whether bacteria or viruses or plants, and various ecological and human safety problems that could result. Ernst Mayr encouraged Phil Regal to take an active role and create a countermovement within the scientific community to apprise people of the risks. They wanted to make sure people weren't hearing only from the promoters of genetically engineered foods, and they also wanted to get the genetically engineered food venture in line with sound science. Neither of them felt the venture was aligned with science as it needed to be. Phil got involved and came to play a very prominent role. He interacted with many government agencies, with President Reagan's Office of Science & Technology Policy and with the National Science Foundation. He became frustrated because the different agencies pretended they were paying attention and kept promising to do something. Then he realized that the main things that he thought were going to happen didn't happen, and he eventually signed on as a plaintiff in the lawsuit I organized. As I relate in the book, based on considerable experience he came to believe the only way the FDA was going to adhere to sound science and follow the law was if a court required it. There was no rational, science-based way to persuade the agency to change its policy. The only resort was to take them to court. That's how I got to know him. Over the years we corresponded, and when he learned I was writing this book, we had some discussions. He liked the way I was planning the book and said he would be happy to give me all of the notes he took over the years. Some of the revelations that come through his recollections and his recordings of what happened are dynamite. They're dramatic and eye-opening. That's one thing that makes my book special; having the benefit of the notes Phil Regal took over the years during his frustrated campaign to align the genetic engineering venture with

sound science. I think he deserves a National Medal of Science and more. Phil Regal is a hero who deserves a lot of praise and recognition.

**ACRES U.S.A.** Another character who plays a dramatic role in your story is Elaine Ingham. Could you summarize how she may have helped the world dodge an enormous bullet?

**DRUKER.** There was a genetically engineered bacterium that was just a few weeks away from release. It had gone through the EPA's review process. Elaine was a professor of soil science at Oregon State University, and Michael Holmes was one of her graduate students. They had conducted an independent test, and the results were very worrying because the plants that were grown in the soil in which the genetically engineered bacteria had been introduced died fairly quickly, whereas those in the soil with the same kind of bacteria, just non-genetically engineered, were doing okay. That posed a great problem because the bacterial species at issue inhabits the roots of almost every kind of plant worldwide. Given the speed at which bacteria can multiply and spread, the potential existed in the eyes of several reputable scientists for all plant life, at least in North America, to be wiped out, and maybe in other continents as well. Had it happened throughout the world, that would have been the end of higher life as we know it. It would have been a catastrophe the likes of which the world may have never seen, certainly not since the dawn of human life. The risk was huge in terms of potential downside. What was the probability of this happening? It's hard to know, but when you are dealing with potentially catastrophic consequences of that magnitude, a great risk was run even if the probability was low, because of the way risk is calculated.

**ACRES U.S.A.** Let's put this in perspective. If there was even a risk of wiping out 5-10 percent of North America's plant life, that would be an unthinkable catastrophe.

**DRUKER.** Right. That risk had not been ruled out. Some scientists say

you have to find out whether it would have been a risk in every kind of soil type. The whole point is that they didn't have time to do that research beforehand. Based on what evidence was known, even the EPA had to concede that the risk was great. Yet instead of doing more research to find out exactly what it was that created the problem – because we still don't know for sure whether it was a general feature of genetic engineering or a specific problem with what those bacteria were designed to do – which would have been the responsible, scientific thing to do, the EPA more or less closed things down. Elaine Ingham, who, along with Michael Holmes, performed a hero's service, had regularly received research grants from the EPA. Afterward, she could no longer get any grants approved by the EPA. She finally had to stop wasting her time submitting proposals. They treated her like an outcast after she and Michael Holmes may well have delivered one of the greatest services to humankind. I think they are great heroes, and I'm glad you pointed that out. Some years later, as Oregon State University tried to purge any life science faculty who would not get on the biotech bandwagon, or at least stay silent if they had concerns, a letter from a former president of the university was circulated to the life science faculty. It stated that if you have doubts about genetic engineering, if you're not in favor of it, if you plan to speak out with concerns, you don't really belong here. She realized she didn't belong there anymore because she had already received a lambasting from her dean for speaking out at an international conference. She realized her life was going to become increasingly unpleasant if she stayed at that university, so she left and started her own institute.

**ACRES U.S.A.** What was the product in question supposed to do?

**DRUKER.** The bacterium was supposed to digest and help decompose agricultural crop waste to create a by-product in the form of ethyl alcohol that could be used as a fuel. The sludge was supposed to be a good composting fertilizing material that

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could be spread on the fields. It seemed good, there were going to be two good things coming out of it. We'll take crop waste, we'll allow bacteria to act on it, we will get ethanol to substitute for fossil fuels and at the end of the process be able to spread the waste on fields and not have to use as much synthetic fertilizer. It all sounded neat but of course that sludge was going to have the live bacteria in it. If they had been able to out-compete the natural form of the bacteria and become established in North America, it would have been a huge disaster.

**ACRES U.S.A.** An absolute fiasco?

**DRUKER.** Yes. That's why David Suzuki, the eminent geneticist and ecologist, said the implications were terrifying.

**ACRES U.S.A.** It's striking in the early chapters to learn how difficult it was to figure out how to pull off the genetic engineering of plants. It occurred to me that in a different context, say fighting intractable human diseases, this would be a thrilling story of dogged innovation on the part of dedicated men and women. It's because the goal of engineering crops is so dubious that the effort expended comes across as perverse. Were you struck by that?

**DRUKER.** The chapter that discusses how genetic engineers persevered and finally overcame so many natural barriers in order to develop genetically engineered crops is titled "Genes, Ingenuity and Disingenuousness," and I think the ingenuity was there, but there was also disingenuousness because they misrepresented what they were doing and how unnatural it was. When it comes to food, they tried to pass it off as a simple extension of traditional breeding techniques when they were actually breaking through several natural barriers without asking if those natural barriers are perhaps there for a good reason. Keeping genes from intermingling between biological kingdoms the way

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"There's still not one iota of mandatory regulation of the genetically engineered food industry imposed by the U.S. FDA. They should by law, but in practice nobody even has to inform the FDA if they're going to dump a genetically engineered food product on our market, let alone do any testing."

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we're trying to do might be a good idea. Further, it was not just a matter of inserting the transgenes – they also needed to artificially boost those genes so that they would actually function in a foreign environment, which essentially deregulated them. This was all highly unnatural, yet they claimed what they were doing was more precise and even safer than traditional breeding, which we know is safe. It has a history of safety that goes back thousands and thousands of years. They were not willing to face the reality that they were disrupting nature in several ways and creating situations that were significantly risky. We know that in attempting to cure human disease through gene therapy, there have been problems. At least they've recognized the risks there. But when it comes to genetic engineering in agriculture, they try to pretend there aren't any or that conventional breeding is even more risky, which is not true at all. The biotechnicians slandered natural reproductive processes and the innate workings of nature because they wanted to make nature look unruly, unpredictable and unsafe compared to what they're doing. If you look at their characterization of nature and then compare it with how elegant and beautifully integrated natural processes are, and look at the way food-yielding organisms actually work – at their reproductive processes and how genetic diversity can be enhanced and yet the genome is maintained generation after generation, and the safety of the food continues generation after generation – it is amazing. That's why many scientists who don't believe in intelligent design

often use terms like "near-miraculous" when they talk about the way that living organisms are organized. Yet if you listen to the bioengineers it's this huge mess going on, and they're saving us from being exposed to it.

**ACRES U.S.A.** They've libeled Mother Nature?

**DRUKER.** They really have. I think it's a libel against nature, and it's wrong because nature is far more elegant and better organized than they say. My book goes into that quite a bit because they've misrepresented and maligned nature. They shouldn't get away with that.

**ACRES U.S.A.** Could you describe the different media coverage you encountered in the United States and in Europe?

**DRUKER.** At a well-attended press conference in Washington D.C. back in 1999, I announced the sad state of affairs at the FDA. I revealed what our lawsuit had uncovered from the FDA files, read key quotes from the FDA documents and made those documents available to the media. Since then there has been, to my knowledge, no major exposé in the mainstream U.S. media about the FDA fraud. There was a tangential reference to it in one article that was never followed up. In fact, investigative reporters who wanted to do exposés had their stories quashed by higher-ups. Jane Goodall said the whole book was one of the most chilling books she's ever read, and that the chapter on the malfunction of the media was

one of the most chilling chapters in the book. I think anybody who reads it will see why. What is supposed to be a free press in the world's most free society has engaged in self-censorship and become part of the cover-up and the fraud. It's just amazing and it continues. When I went to Europe in 2000 and traveled to several countries and gave press conferences, not only were they well-attended, but they were well-reported, and the European media was replete with news about the FDA fraud and what the FDA scientists had said. There already had been a greater awareness on the part of the European public about the risks of genetically engineered foods, and there was scientific controversy because the media had reported the Pusztai study. That happened a few years before I got over there with revelations from the FDA files. The mainstream media had already been reporting the facts, and they had been reporting it more thoroughly. I think that goes a long way toward explaining the differences in public knowledge and public attitudes about genetically engineered foods in Europe as opposed to the United States. And Canada as well I should add, because the Canadian media from what I can tell have not been a lot better than the U.S. media. Unfortunately, activists in the UK have told me things are very different over there now. The media there have fallen under the spell of the incessant disinformation being dispensed by the scientific establishment, and they now seem to believe that genetically engineered foods have been demonstrated to be safe through sound, solid scientific research, that the benefits far outweigh whatever risks exist, and that the U.K. really should catch up for lost time and start commercializing these crops in a big way. That's why none of the science reporters for any of the major London newspapers would attend the press conference that Jane Goodall and I held. So many scientists are mouthing the party line that the media in the U.K. and much of Europe have been taken in. That's a great shame. That's also scary.

**ACRES U.S.A.** Do you think it would take an immense health disaster such

as the L-tryptophan incident but with more fatalities to force a hard look at what is being done? Whereas the reality of a large, uncontrolled experiment in human feeding, which is what we've had for 20 years, is that these chronic health effects such as increasing numbers of allergy sufferers are easy to pin down and not actually killing people, only making them miserable?

**DRUKER.** Well, it's certainly uncontrolled. It's certainly massive. It's not an experiment, certainly not in the scientific sense of the word, because it's not only uncontrolled, but we don't know who is eating genetically engineered foods and in what quantity. They have permeated the food supply in North America. No epidemiological studies have been undertaken and none could be because there's no labeling. We don't have test groups where they track how much of *this* food you're eating, as opposed to how much of *that* food. We don't know any of that, so even if there was a major health disaster, it would be well nigh impossible to link it to a particular genetically engineered food. That's why the precautionary principle was instituted by the United States' food safety laws – to prevent such a situation so that foods containing new additives could only get to market if they had been rigorously tested and demonstrated safe. To avoid a situation where you've got hundreds of millions of people consuming products with no real way of determining whether any harm that may appear is linked to that product. Look how long it took for the L-tryptophan disaster to be understood. First, it took quite a while, even with a novel disease, to understand there was something going on that was unusual, and then it took substantial effort to trace it back to a particular food supplement and to then find out that supplement was the only one which was genetically engineered. All that took a long time. But look at the subterfuge; look at the misinformation that has come out about it. Look at how confused people are about the case, which was well-documented as linked to a supplement produced from genetically engineered bacteria, with evidence that points toward genetic engineering as the

key cause of the toxic contamination that caused the epidemic. Yet what is the common knowledge? What is the common wisdom? That either no genetically engineered food has ever been linked with a human food problem, or that it was proven that genetic engineering had nothing to do with it, that's what you'll see.

**ACRES U.S.A.** Statements that are reiterated despite being provably false accounts of a health crisis in which people died?

**DRUKER.** There may be chronic problems happening right now in our population from these foods that we will never be able to establish because the incidence of a disease would need to double before we knew something really fishy is going on. Then being able to link it to a particular GMO – I don't see how it would happen, nor do most of the scientists with whom I've spoken.

**ACRES U.S.A.** Among the dozens of studies that proponents love to cite as showing we have no problem here, do you still notice a really pronounced lack of long-term animal feeding studies?

**DRUKER.** There is a huge double standard – a double standard where even the sloppiest kind of studies or even no research has become the standard. The fact that there have been no detectable epidemics in the United States since the introduction of GE food crops is somehow supposed to be proof that they're safe. In addition, sloppily conducted studies are accepted by the proponents as demonstration of safety. But when rigorous, carefully controlled studies that show problems are published in peer-reviewed journals; those are viciously attacked as scientifically unsound. There have been several solid studies that raise concerns, and if we were in the least precautionary we would shut the whole thing down until adequate testing has been done. There have been very few studies that were long-term, very few multi-generational studies. We would need the most rigorous kinds of tests to even come close to the kind of testing that

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is done by software engineers when they make even minor, truly precise, surgical changes to complex information systems that they themselves designed. They still know there can be unintended disruptions, and they go through extensive testing to detect any unintended changes and make sure there won't be bugs that could crash a life-critical system such as an airplane guidance system, or cause a pacemaker to malfunction. Nothing close to that kind of testing has been done in the case of genetically engineered foods.

**ACRES U.S.A.** Are you amazed when you hear the argument that this technology could be instrumental in addressing world hunger?

**DRUKER.** That is the go-to argument when the evidence goes against them. They say we need this to solve hunger, that the critics are being heartless, and that this technology is going to have huge benefits that will offset any risks that critics may be talking about. However, from the standpoint of U.S. food safety law, it's illegal to try to offset risks with projected benefits when it comes to food additives. Such an offset is reasonable and legitimate in the case of pharmaceutical drugs, prescription drugs. But it's illegitimate and illegal when it comes to food safety. Moreover, even if we decide to look at the benefits and see if they're there, they're not. It's a bunch of baloney. Chapter 14 of my book goes through those claims and shows how there have been several well-conducted studies by independent scientists which have clearly concluded that genetic engineering is not necessary to address the world's food problems. Agro-ecological approaches to agriculture are going to be the best from an agricultural standpoint and from a

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“That is the common theme — independent scientists who are not under the influence of the biotech industry know we don't need genetic engineering. What we do need, what will work, what has been demonstrated to work by dozens of studies, are smaller-scale approaches rooted in agro-ecology.”

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sociological standpoint. Genetic engineering is not needed, and all of those arguments are just more bombast. Further, it's important to re-emphasize that even if those purported benefits had not been refuted but had been demonstrated, it's illegitimate to try to offset risks according to U.S. food safety law, and these foods still would be on the U.S. market illegally.

**ACRES U.S.A.** Do you think it's fair to say that the main driver behind this technology is simply selling more weed killer?

**DRUKER.** That's only the prime motivation for the majority of crops currently on the market. But remember, there are several genetically engineered foods that are not resistant to one weed killer or another, and many more in the pipeline, so it's much bigger than that. The Bill & Melinda Gates Foundation is trying to develop crops that are engineered to have better nutrition or to be salt-resistant or heat-resistant. Conventional breeding has done quite well in developing salt-resistant and heat-resistant crops. We don't need genetic engineering with its increased risks to

develop crops that are resilient to changing conditions. When I mention those independent studies, one of the biggest was co-sponsored by the U.N. and the World Bank, with participation by hundreds of independent scientists throughout the world. The results have been endorsed by dozens of governments. That study concluded that genetic engineering isn't needed. There is really no significant role for genetic engineering in addressing the world's food needs. What has been demonstrated to work in the Third World are agro-ecological techniques. They can build up healthy soil instead of killing off the essential microorganisms that make soil fertile. That is the common theme — independent scientists who are not under the influence of the biotech industry know that we don't need genetic engineering. What we do need, what will work, what has been demonstrated to work by dozens of studies, are smaller-scale approaches rooted in agro-ecology.

### NEED MORE INFORMATION?

For more information on the Alliance for Bio-Integrity, visit [www.biointegrity.org](http://www.biointegrity.org).

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