The Myths of Safe Pesticides:  
A Special Interview with André Leu  
By Dr. Joseph Mercola

DM: Dr. Joseph Mercola  
AL: André Leu

DM: Most of us have no concept as to the amount and the variety of chemicals that are sprayed onto most produce that we eat. Hi, this is Dr. Mercola, helping you take control of your health. Today I’m joined by André Leu, who has written a book, *The Myths of Safe Pesticides*. He comes to us from the southern hemisphere, in Australia. He has a long time history in organic agriculture and has written a really terrific book, which I’ve referenced a few times on the site with respect to the number of chemicals that we’re being barraged with in our environment and the lack of safety testing that has occurred.

So, welcome and thank you for joining us, André.

AL: It’s my pleasure. Thank you for having me on your show.

DM: Most of our listeners or viewers haven’t been exposed to you before. How about providing us with some background on how you became interested in this area of pesticide use in the produce?

AL: Actually it started [when I was] a child. I was one of these children who would actually get quite ill when exposed to pesticides. In some parts of the family farm, I would get ill. Other times when we would go to areas where grains are stored, I would end up being seriously ill during the day. By the time I started farming… I was always going to be an organic farmer because they affected me.

Now, I suppose as the years go by, in the farming communities, I see all the illnesses in the families. For instance, the amount of cancers, particularly breast cancer; the amount of children born with a whole range of problems like autism, attention-deficit hyperactivity disorder (ADHD), bipolar disorder, schizophrenia spectrum, neurodegenerative diseases, and heart disease. I could go on and on and on. You start to wonder. When you say it’s pesticides, you’re always told, “No, it can’t be pesticides. They’re scientifically tested. When used as directed, as your farmers evidently do, there should be absolutely no problem on pesticides.”

DM: Thank you for that perspective and background. Let’s get into the numbers and some specifics now. Because in your book, you said that at least in the United States, there are 80,000 registered chemicals used. And of these 80,000 (some people think it’s millions, but 80,000 is still quite a few), only a few hundred are tested for safety.

AL: Yeah, exactly. And if you want to know where I got that data, that was from the United States President’s Cancer Panel Report. They pulled it out. There’s only a few hundred that were tested, and even that testing is considered to be inadequate by most toxicologists or scientists in this field.

DM: Part of the reason it’s inadequate I suspect would be if they do test for safety, it’s just an isolation. Maybe you can review the issue that most of these chemicals are using combination, multiple combinations, and no one’s testing for the synergies between these chemicals.

AL: Exactly. This is a very important point. There are two aspects of that: firstly, the product that a farmer buys is a cocktail of different chemicals. You have what they call the active ingredient in the pesticide and then you have the other synergists, adjuvants, and other chemicals like solvents that are also toxic, which are add it to make it work more effectively. But they only test the one ingredient they call the
active ingredient and they ignore the others by pulling them inert. The actual combination that is sold and used on our food is not tested.

**DM:** Yes. I think that’s quite going to be surprising for most people, because the assumption, of course, is that the government is there to protect us and that it’s doing this rigorous, objective, non-conflict-of-interest evaluation to make sure that no adverse reactions are going to be from these chemicals that are being just literally soaked into our food supply. So, you’ve compiled a number of interesting myths about the use of pesticides. Why don’t you review some of the top five ones?

**AL:** Okay. Well, the one we started talking about is “the rigorously tested myth,” that all chemicals are scientifically tested. The fact is the vast majority aren’t. When we looked at how they’re tested, that is also an issue. Most of the toxicology that is used these days is very old-timers. In fact, sometimes it’s 400 years old. Other methodologies are close to 150 years old. And believe it or not, science has actually moved on a bit since then.

We have much more rigorous and sensitive ways of testing instead of just feeding animals, destroying them, and looking at their organ parts under a microscope. We can now use things like magnetic resonance imaging (MRI) scans, actually look inside the living animals and humans and see where there’s damage. We can use cell lines, human cell lines, culture them, and actually look at the levels of damage.

When you do that, you find that in some cases, you can go down to parts per trillion and get significant toxic effects. For the listeners to understand what a part per trillion is, if I were to get three Olympic-sized swimming pools and just put one drop in there, that is a part per trillion. We now know that there are hundreds of chemicals that can cause adverse effects at that level.

**DM:** Yeah. And then even if it’s a higher dose, it could actually be worse, as you mentioned, because of the ability to mimic hormones in our systems. At parts per trillion, it may not cause a problem. But at parts per billion – actually it’s reversed.

**AL:** Yeah.

**DM:** At parts per billion, it may not cause a problem; but at lower doses and concentrations, it may assimilate certain receptors, primarily estrogen receptors, that can cause hormonal disruptions.

**AL:** Exactly. What we know now particularly would be when the fetus is developing – because it needs these actually hormonal signals – in parts per trillion, it could trigger the development of hormone system, the reproductive system, the nervous system, the brain system, the limbs, and a very small amount of hormones that are needed at specific times for a baby to develop normally. Now, if we disrupt it with something that’s like a synthetic estrogen or an antigen – there’s a whole range of them – in parts per trillion, we stop that signaling and then those parts on the faces of the baby do not develop properly, and it affects them for the rest of their lives.

**DM:** Yes. That’s quite surprising to know. But what’s interesting with these ones that mimic these hormones is if you put them at a higher concentration, they actually won’t cause a problem or at least not as severe with respect to the hormone disruption. Can you review some of the other myths?

**AL:** I think the other one, as far as what we’re talking about is “the very small amount myth.” We’re always told, “Look, the amounts are so small that we don’t need to worry about it.” What they do is when they set the average daily intake (ADI) for pesticides in food, they feed animals. They reduce the thing to the point where when they look at the animal under a microscope, they can see no signs of damage. That’s called the no-observed-adverse-effect level (NOAEL). Then what they would do is they will reduce that amount by a factor of 100 or 1,000. They extrapolate it. They base it on the concept that the lower the dose, the less poisonous it is.

But what we know with endocrine disruptors is that when you lower the dose, they can become more toxic. This is a data-free assumption. They do not test the actual low dose of the ADI. Not one chemical is
Another myth is “the breakdown myth.” We’re told that the new modern chemicals aren’t like the old ones like dichlorodiphenyltrichloroethane (DDT); they readily biodegrade and breakdown. That can easily be challenged because many of them are residual. In fact, atrazine and neonicotinoids, which we’re having issues with the bees and birds and humans. But I think the real one we need to get across is that if they readily breakdown, why do we have residue levels? Why do we have immunoresidue levels or average daily intakes for all these chemicals? Because the fact is they are on our food.

The other thing we know with many of them is when they break down, they just don’t disappear. They break down into these metabolites that go with the products. And quite a lot of them... For instance, I’ll give organophosphates as an example. They break down to oxons, and suddenly they are 100 to 300 times more toxic. To say that they break down is one thing. But they don’t mention that actually when they break down, they are worse.

DM: Yeah. We have a similar process occurring in the disinfection of water, municipal water supplies, with chlorine. Chlorine itself isn’t the greatest. But it’s relatively inert compared to when it combines with organic material in the water and you form these disinfection byproducts in which there are hundreds of them and they’re 10,000 times more toxic than chlorine. That’s really the bulk of the problem.

AL: I actually gave that as one of the examples in the book. There’s a very good study actually showing that one of these major byproducts from the chlorine in water is causing increase in allergies and sensitivity in people in the US.

DM: Yeah. It’s not really a pesticide, of course, chlorine. At least for the most part it’s not used as a pesticide; it’s used to disinfect the water supply. And it provides a good service. I mean, really, we save a lot of people’s lives by not getting sick from infections in the water supply. But it comes at a price, which is a pretty significant surprise, allergies being one. That’s a toxic exposure that’s accumulated over time. What we’re becoming more aware of now – and the science is pretty strong – is the importance of the human gut biome, the microbiome.

AL: Yeah.

DM: This chlorine, [it’s] great. It kills infections in the water supply – or pathogens – but it also kills your beneficial bacteria. That has profound implications even neurological implications, because the gut really is our second brain. It’s all connected. You got to be careful with these chemicals.

AL: Exactly. The other side of it... In a country like Germany, it’s actually illegal to chlorinate their water supply. They actually use a combination of microfiltration and ultraviolet (UV) light and have clean water without any chemical residues. For all these chemicals, there’s always a viable alternative. If Germany can do it for the whole country, so can all other countries.

DM: Wow. I never was aware of that. Thank you for letting me know. I didn’t realize that, first of all, it was even possible and that, two, there was this whole country that outlaws chlorine, a significant country.

AL: Yes.

DM: I mean, Germany is no backwards country. That’s for sure.

AL: I think the next that we’ll go into following on from that is “our regulatory authorities myth.” that they are using very good science, that they’re protecting us, that there’s no conflict of interest, and that we can trust them. If they say it’s safe, it is safe. I pulled that myth apart as well and showed how they are ignoring hundreds and hundreds and hundreds of very good published peer-reviewed scientific studies, showing the adverse health effects of these chemicals when all they are really taking into account are the studies that are submitted to them by the manufacturers. That really is a conflict of interest.
And then if you go through the book, I showed how so many of the methodologies that they use to establish the safe residue levels are actually data-free assumptions; they’re not based on evidence. They’re not using evidence-based science to determine the safe level. You can see in the end that these decisions aren’t scientific; they’re actually political. Why is it that, let’s say, atrazine is banned in Europe because it’s dangerous, but here in the States and in Australia, it’s perfectly safe? Or…

DM: Well, it’s not perfectly safe; it’s perfectly legal.

AL: Yeah. Or perfectly safe as directed. Perfectly legal, I mean. But surely what is toxic for people in Europe is toxic for people in the States.

DM: Oh, absolutely. I’m not sure if this is one of your myths, but maybe you can address the issue of these chemicals being actually relatively pervasive and winding up in our bloodstreams. In fact, in your book, you have quoted a 2009 study by the Environmental Working Group (EWG) that found 232 chemicals in the placental cord blood of newborns in the US, 232 – and that data is five years old!

AL: I know. And nothing’s been done on it. There are lots of studies now around the world when you look at developed countries, particularly in the US. All of us, we carry a cocktail of chemicals in our blood. But I think the most disturbing one is that we know now with children, they’re being born crippled.

The Environmental Working Group study is just one. There are lots of studies. There’s a very good paper written by Dr. Theo Colborn in which she outlines them all. Children are being born, from conception to being breastfed, they’re getting chemicals all the way through. They can test in their placenta cord blood [and] the cranium. They can test the breast milk. They’re finding that so many chemicals are going into children.

We know very well that the smallest amounts can infect them, far greater effects than it affects adults because children don’t have the protective serum proteins that we have as adults, which detoxify them. It’s a massive issue. The regulatory food authorities are completely ignoring the specific issue of children. They test only for adolescent and adult animals, but there’s no specific testing for the embryo and the developing young.

DM: Up to now, it’s just been a pretty discouraging interview because it’s all bad news. Maybe we can take a slight tangent, give people some hope and encouragement, and talk about some of the solutions on how it is possible to avoid this mess. The statistics we’re quoting are really for the vast amount of food that the majority of Americans or people in the industrialized world are exposed to, but it’s possible to avoid. Maybe you can address that topic and the good news, the good news side of this.

AL: Yeah.

DM: And really the motivation, encouragement, and inspiration to pursue an alternate lifestyle, which is a bit of a challenge, but has a benefit of avoiding these dangerous chemicals.

AL: Exactly. Look, when I started the book, the first chapters are really bad news, unfortunately. But I end the book with good news because there are ways of getting around it. The simple thing for most people is to eat organic food, avoid these chemicals, and take precaution in principle. We have good studies now showing that when children are eating organic food and they’re urinating, metabolites of pesticides drop down to zero within about four days.

DM: Wow.

AL: It is very easy to get it out of your system.

DM: That is very encouraging.

AL: Yeah.

DM: There is hope. It’s not something that’s going to take months or years.
AL: No. For many, I think… Our most important asset is our children. Maybe [for] you and I, the damage is done. But for God’s sake, for our children, we should be giving them the best we can in life. That means any young couple who’s planning to conceive, start eating organic food now, so you can be done with these heavy toxins. Give your baby the best chance through pregnancy and through breastfeeding. And for the rest of their life, make sure that they eat organic. That way, they won’t get these pesticides at any level.

DM: Okay. All right. Well, thank you for the good news, because if people get the bad news all the time, they’re going to turn us off. Why don’t we go continue with the rest of the myths? That will provide further encouragement for them to pursue an organic lifestyle. Or even better, grow their own food, which is possible and really quite a phenomenal hobby, for my perspective, because not only does it get you back to nature and helps you save money, but provides the basic building blocks for you and your family to get healthy and avoid these dangerous chemicals.

[----- 20:00 -----]

AL: I couldn’t agree more. It’s very easy to do even if you’re living in an apartment. I know lots of people who can do it. It is very rewarding. I can tell you as a farmer myself, there is nothing better than literally harvesting or eating the fruits of your own labor. That is so satisfying. Of course, the other one I want to say as an organic farmer is, from my experience – and I’ve been on every arable continent for 40 years – that now with organic practices, we can get equal to higher yield than conventional and that there is absolutely no need for any synthetic pesticides or fertilizer.

DM: Well, I would even extend that any synthetic fertilizers.

AL: Exactly. Or all fertilizers either, yes. Exactly. I go through, in the book, on how the combination of synthetic fertilizers and pesticides in drinking water can cause massive, massive problems, a very good work done by Warren Porter and his colleagues at University of Wisconsin-Madison.

DM: Okay. Why don’t we go over a few more of the myths?

AL: All right. That is essentially [it]. I’ve just put in five myths.

DM: Okay.

AL: But we can delve into detail. I think one of the myths, I wanted to overcome in the book was that organic agriculture is low-yielding and that we have to have pesticides otherwise the world will starve. How do we feed nine billion people in 2050 unless we have genetically modified organisms (GMOs) in pesticides?

I gave very good examples. In the United States, for instance, there are fewer farmers now who are getting equal to high yields than conventional. As we’re getting scientific research into organic growing, we’re seeing issues. Now, conventional agriculture in the US is regarded as the highest-yielding in the world. We can get the same equal with organic. That shows that we have no problems with the yield. But then I go into where most of the hungry live. We have 800 billion people who do not have enough food. Another…

DM: No, 800 million. There’s only seven billion…

AL: Sorry, 800 million, yes. Please. Thanks. We don’t quite have 800 billion on the planet yet.

DM: Yeah, that would be a bit of a density population.

AL: Yeah, sorry. That’s 800 million, sorry. And then there’s another billion who are micronutrient-deficient. Yes, they’re technically getting the empty calories, but they’re not getting the vitamins, minerals, and the antioxidants. They’re on deficient diets. When we look at who these are, much of them are actually small family farmers, smallholder farmers, in the developing countries. They’re getting very low yields.
When we have good gardens, when we work with the traditional systems, and teach them good organic practices, on average, we can actually give them more than 100 percent increase in the yields. We take them from abject poverty and in some cases starvation, the kind where there are people who actually die, through relative prosperity in their own communities.

They can afford nice houses. They can afford to send their children to school. They can afford medical expenses. In a lot of cases, they don’t really go out and socialize because they don’t have good clothes; they don’t feel decent. They can actually get nice clothes and socialize, and get this sense of community vibrancy back. Their children are starting to return back to the farms now because of a brighter future. The numbers that we’re getting now, what we collect from our farm, we’re getting about 200,000 new organic farmers a year and it’s growing. It is impressive, the change and what we can do.

DM: Yeah. That’s great. Even if organic agriculture wasn’t as productive as conventional agriculture – and you’ve laid a pretty good argument that that’s not the case and I believe it; it could be superior not only from yield but from nutrient density. I think the more important long-term solution is the sustainability of the soil. Most of the conventional agricultural or industrial agricultural practices are degenerative. They’re decimating the topsoil. We’re losing it. We’re essentially committing future generations to having no good soil to grow their food on.

The important part of the organic approach is typically its regenerative practices like no-till, minimizing the use of synthetic fertilizers, integrating livestock, and cover crops. This actually rebuilds soil up; it doesn’t lose it. That’s going to speak well for our future generations.

AL: Exactly. And that’s what we’re talking about. We want to leave a better planet for the next generation, and that’s exactly what we’re doing with regenerative agriculture. I’ll give the Rodale Institute’s biochar in Pennsylvania as an example. It is an excellent example of how with good organic practices, not only are they getting the same and, at times, higher yields than conventional, but they are improving the soil every year. Their farm is getting better, whereas the conventional farms are degrading.

DM: Yeah. I recently interviewed Gabe Brown, who is a really great organic farmer out in North Dakota, which is from the United States, one of the most miserable states to grow food in because of the severity of the climate, yet he’s still able to integrate these practices and get very productive crops and produce more topsoil every year, which is good.

AL: Yeah. It’s great that North Dakota is doing exactly the same. You can do it anywhere – from the Canadian Prairies, to [North and South] Dakotas, down to the Crockett. There is no climate with the right methods where we can’t have organic agriculture and improve the system.

DM: Now, as we mentioned earlier, the best way is to really grow your own food, or if that’s not possible, to buy organic produce and meat – organic food, period. Are there any other strategies with these 1,400 pesticides approved and registered by the EPA that the typical person can integrate or implement to educate themselves to the extent of this exposure and how they may be able to avoid them other than just growing food or buying organic? Or is that pretty much the extent of it?

AL: Look, [in] the book, I wanted to keep focused more specifically on pesticides and the human health. But for instance, bodycare products, they have a lot of toxic products. That’s another book again. I didn’t want to get too tied to that. The same thing again, if you’re going to buy bodycare products – shampoo, soaps, makeup, or body lotions – buy organic ones because of the toxins. It’s the same with clothes. Buy organic cotton, wool, or all the textiles that you want – organic hemp because of the toxins again used on some of the dyes, for instance, some of the pesticides used in the production. You can avoid all that.

The thing is what you really want to do is have a pesticide-free lifestyle. In your own house, make sure you’re not using it and in your own garden, don’t use it. I get asked all the time, “I’m growing roses or growing my own food, what do I do to get rid of the bugs?” There’s a very simple thing required: soap and water. Just use a nice, mild soap and water. Just spray that on the bugs. That will kill every bug. Not
because it’s poisonous; it just blocks off those breathing holes. If we put soap on our nose and down our throat, we couldn’t breathe. They die. You spray this regularly in the garden. Regular exposure to soap and water is a pretty good thing. It’s not going to be harmful.

**DM:** Well, it may not be that good. I actually caution people to limit their use of soap and water, because first of all, many of them are antibacterial. They have chemicals like triclosan, which are pretty dangerous. Even if it’s not, it tends to wash away the sebum, which is the protective fatty acids that are produced to really form an armor over our skin, so we can prevent getting infection. Overwashing can be a huge issue with soap and water, even if it’s plain soap without antibacterial.

**AL:** Yeah, I agree, particularly with antibacterial and then some of the preservatives in soaps as well. That’s why I advocate a mild natural soap, not detergents. But I think we can reduce it with things like vegetable oil, emulsified vegetable oil in water. You spray that over plants. That works the same way. It blocks the breathing pores of the pests and they die. But it’s not toxic. It’s a food-grade vegetable oil that you have as a salad dressing or [use in] cooking.

**DM:** And I was thinking of one of the other practices that one can integrate to avoid these chemicals, to add on to what you already said, would be to avoid the use of plastic containers for your food because they’re loaded with these other estrogen mimics, which are not only BPA. Because a lot of containers have BPA-free [labels], but that’s hogwash. It’s almost as much of a deception as the word or term “natural” when it comes to food, because there’s this whole family of these chemicals that are used in plastics. Just stay away from plastics. There are also phthalates in there, too.

[----- 30:00 -----]

**AL:** Yes, that’s right. There are phthalates, too, in all the pesticides. You’re right. There’s a suite of them. Most of them don’t have any adequate testing as is pretty usual with these chemicals. But I think that the best thing or way possible is to avoid synthetics and try to get things as natural as much as possible. And you know that hasn’t been produced in pesticides.

**DM:** Yeah. It’s interesting. It’s just the more you study, the more you realize it’s just back to basics. Thank God that technology is advancing. We can take advantage of a lot of its benefits. But we have to be careful and use it very wisely and cautiously, just not indiscriminately like most of us tend to do.

**AL:** I agree very much with that. Powerful technology can bring powerful benefits and powerful problems.

**DM:** I think that pretty much covers most of the questions I had. Are there any points you’d like to emphasize or reinforce, or other issues you’d like to review?

**AL:** As far as anything, I would like to say that what is very important is that we see a shift in the way the scientific research funding for agriculture goes. At the moment, it’s only four dollars out of every thousand that is spent in agriculture, spent on solutions for organic. We know now that with the science we have that we can get equal to greater yields. But if we can shift this research away from GMOs and pesticides towards organic methods, we can scale our farming worldwide. We don’t have to have any pesticides in our food. I think that’s a really important priority that we need to get across the government, the industry, and the regulatory agencies.

**DM:** Well, that would be a bit of a challenge because most of these regulatory agencies have a revolving door.

**AL:** I know.

**DM:** Between them and the industries that they’re supposed to be regulating. It’s very clear for Monsanto. I mean, there are probably dozens of corporate executives who went through that door and wound up in regulatory agencies of prominence and have significant influence. The average person is not going to be able to touch that. Are there any specific strategies you’d recommend?
**AL:** You know what the best strategy is? The most powerful thing we have as consumers is how we buy. Demanding organic wherever you go. Doing that demand, that will be the driver that we’ll get more and more farmers to transition their farms to organic. Consumer demand is an incredibly powerful instrument if people could exercise it.

**DM:** Yeah, I couldn’t agree more. That was the case until a few years ago. But what we realized is that what’s taken priority with respect to demand is the “Non-GMO” label.

**AL:** Yes.

**DM:** [It] has become even more important. That’s largely as a result of our efforts to help label these foods in different Western states in the US. I think that’s a very exciting sign. It’s making a difference. It really is. These companies are running scared. The only point I would add to that is to also, in addition to non-GMO and organic, is to make sure that the farmer is using regenerative soil techniques. Because even if they’re organic, that doesn’t mean they’re using that – no-till, cover crops, and things. I think that would be even a further step towards improving the quality of the food and the quality of the environment.

**AL:** Yeah. That is very important. And actually, we find now on the hoe with the United States Department of Agriculture (USDA) regulation that farmers didn’t have to use cover crops and rotations. The issue of organic and no-till, it’s still scaling up at the moment. It’s scaling out from the initial work that the Rodale Institute has done. But we’re actually seeing it taken up quite a lot level globally now, which is really interesting. I myself, that’s something I’d really like to see taken up across the globe because we know the multiple benefits.

**DM:** Independent of global climate change, I mean, there are huge major beneficial regions for regenerating soil and putting carbon back into the soil where they belong, instead of extracting it with these industrial agricultural techniques that they’ve been using for the last century.

**AL:** I talked about that in the book in terms of, you know. Not so much about mitigation but actually in terms of building resilient farming systems.

**DM:** Yes.

**AL:** Getting drought resistance, better uptake of water; or the multifunctional benefits of putting carbon in the soil and building up organic matter.

**DM:** Yes. Carbon is the key. One of the biggest strategies that most organic farmers do – and they may not realize this – is that they’re carbon farmers; they’re putting carbon back into the soil.

**AL:** Exactly. Exactly like carbon farming. And I always think that there should be a way that they get rewarded for it. Probably their main reward is that they’re getting better farms.

**DM:** Yeah, and contributing to the health of their community and the planet. Well, thank you very much for writing the book and for providing a great resource for people to explore if they’re concerned about this issue. I highly recommend *The Myths of Safe Pesticides*. It’s a great read. Definitely pick it up if this is an area of interest for you. Thanks for all your work and I appreciate you being on the call with us.

**AL:** Thank you. I really appreciate it.

[END]