Chapter 2 - Myths of Safe Pesticides 1

Andre Leu: The other one when we're talking about this cocktail effect, not just a formulation, but in farming, you know farmers just don't use one pesticide. When these pesticides are approved, multiple pesticides are approved for a crop and when I'm using the word pesticide, that's the generic word for all these 'cides': herbicide insecticide, you know fungicide and so on, pesticide is the generic word. But what will happen in any normal crop, there'll be several insecticides, there'll be several herbicides approved, fungicides, maybe miticides. And the expectation is that all of them are used in a normal crop production cycle and that's the reason when we do comprehensive testing of food virtually everything, conventional food doesn't have one residue, it has multiple residues. And on top of that we don't eat just one food, we quite a range of foods. So, we're getting a whole range of multiple residues from multiple foods and so we're getting these cocktails. There's absolutely no requirement for the testing of cocktails. The assumption that somehow that the toxicity level is going to stay the same again, no change. But where there is testing, and once again it is by the independent scientists and researchers who publish in peer review journals, scientific gold standard, these cocktail mixtures are synergistic, not just additive. Additive means 1 and 1 equals two. Synergistic means that it will equal more than two, in other words three, four and I have some papers showing one and one can equal 100 or one and one could equal 1000. That's the way that you can actually increase the toxicity through the synergistic effects. What to me is really concerning is this. When this test, done in the United States, looking at the number of chemicals in placental blood, in other words, what is crossing the placenta into the developing fetus, and in the US they found up at 232 chemicals, but most babies are getting hundreds. And we have zero science as to what that means. What are the synergistic effects? That is a concern. And for me, I really want to say this is a total regulatory failure to keep our children safe, that we're not keeping these chemicals from our children, but worse than that is this data free assumption that somehow this is safe, and I use this word, I keep on using this word data free. They have no evidence whatsoever: zero and based on zero evidence that make an assumption. It's safe. That's not science!

So, the next thing I want to go on now is going over the same thing that these poisons are scientifically tested, let's talk about children. And this is really important because they're our future, you know. I suppose I like studying history and you know; the Chinese gave their Emperor's immortality pills made of mercury. Yeah, and we laugh at that because we know mercury is poisonous, they didn't. Well, in a way it did make them immortal because their bodies didn't break down; that means because of the amount of mercury no microbe's going to decay the body. And then the Romans lined all their drinking vessels with lead, and you know, you talk about the fall of the Roman Empire and you look at the madness of when Nero was fiddling while Rome burned. Now we know that's lead poisoning and what it does to people, they didn't. But we know these things are poisonous, we're using these poisons to kill things and yet we're saying it's okay for these poisons to cross the placenta and go into our developing fetus. You know, what sort of civilization poisons its children? I think future researchers and historians of science are going to look back and just shake their heads and

say this must be the most stupid civilization that has ever existed. Seriously! What I want to say here there is zero requirement of testing for the special requirements for children. I'm going to talk more about it.

Basically, when you know that the animal testing they use, they actually use adolescent animals. But what we know now is that the key developmental periods for humans as a fetus, as particularly as newborns, but growing children and then another really key development time for us as humans is when we go through puberty, that's when another lot of hormones are coming on and at this stage chemicals can really affect it.

So, while the regulatory authorities have zero evidence and have zero requirement to get that evidence, once again, the independent scientists have published not one two, three, but hundreds and hundreds of studies just on the way hormones and chemicals work. On damaging hormones there is over 600 published studies. I'm not talking about you had one here and there, you know, regulatory authorities really have to go out of their way not to find them. They really work hard not to see.

But what I'd like to point out here. Is that what these studies show, is that the smallest amount of some of these chemicals can be harmful particularly on what happens with many of them when they get down to really small amounts. They're basically molecules small enough to bind with what we call the hormone receptor on the cells and then they are acting like hormones, but they're not the hormone so that they basically send false signals. They're called endocrine disruptors, endocrine means hormones. What we know for instance when a fetus is developing, small amounts of hormones basically go and trigger the genes to start saying. "Oh, look! Now's the time to have fingers. Now is the time to have arms. Now is the time to build a reproductive system. Now is the time to build a brain. Now's the time to build eyes and those signals are really sensitive. They are parts per trillion. That's another hormone that is used to trigger the genes in the development of a fetus and also in young children. And also, when children are going through puberty and adolescence. What's a part per trillion? Get three Olympic-sized swimming pools of water and you put one drop in it. That's a part per trillion. And we actually know of hundreds of pesticides that do this. They act like hormones. Many of them for instance act like estrogens and basically trigger and give signals of estrogen. This is actually really important with the development of the fetus we know now. So, the evidence now is showing very, very strongly that that these extra estrogen signals are now responsible for basically the early age of girls going into puberty. We're seeing this is getting earlier and earlier and we know that is one of the basic signs for that of getting breast cancer. The earlier a girl goes into puberty, the higher percentages of breast cancer. But we also know now how important these signals are in terms of giving you a whole range of the diseases of the sexual tissues and I'll talk more about it. But you know there's other types of hormones that actually set off and delay or disrupt other developmental events.

We have a word for this toxicity, we actually call it a monotonic dose. The standard toxicity that is used by our regulators was developed 500 years ago by a guy called Paracelsus and basically the word use now is that the dose is the poison and is based on the concept that any poison if you can reduce the dose to such a point where it's no longer toxic.

And then so when they do testing that's what they do. They feed animals and they have the control that doesn't get it and the ones that get it at different levels. And at some point, they kill the animals and I look at them under a microscope and look at the kidneys and livers and things. What they hope to find is a level where that under microscope they can see no difference between the two types and then they call that the no observable effect level, the NOEL or sometimes the no observable adverse effect level, NOAEL You know, different little versions of it, but essentially what they're saying, under a microscope we can't see the difference. So therefore, this has now reached its level where it is no longer a poison and what we're going to do, to really put a buffer in and make sure they're really safe. Now. Let's make that 10 times lower a hundred times lower. That's the safety margin.

So now there's absolutely no chance that this is toxic, that it can affect you. That's why you need a truckload of vegetables. You have to eat a truckload before you get sick, that's the sort of science and it does seem very reasonable. Good. The thing is you know that's fabulous science for 500 years ago, but you know things have evolved and we actually realized actually in nature things actually are a lot more complex they are not these little simple linear systems. And so, what we know with a lot of poisons there were certain poisons you go down to this so-called NOEL but you take it down lower and you get to the point where that molecule is small enough to bind with a hormone receptor on a cell, the toxicity goes up. It's called a non-monotonic dose where actually the chemical is actually more toxic at the lowest dose than at the higher dose.

I know it seems to people that it doesn't make sense but that is the reality and like I said, we know hundreds of these chemicals now, we do, and we know that most hormones work this way. There is a very good meta-study put out by the World Health Organization and the United Nations Environment Programme on this, reviewing the hundreds of studies that show how this works.

Anybody who tries to doubt this is a dinosaur, you know, it's well and truly accepted except by regulatory authorities. This sort of information came very, very public by the 1990s. And in the 1990s for instance, not in Australia, of course in the APVMA which is pre-dinosaur really. But in Europe there is the European Food Safety Authority, in the US with US EPA both of those regulatory authorities were tasked by their governments In the 1990s to start reviewing pesticides and getting rid of pesticides that are endocrine disruptors, hormone disruptors. Now, we're you know, 2018 almost 25 30 years later three decades later any idea how many they have managed to remove, eliminated despite the fact that we have the literature showing that there's hundreds of them? How many? Yeah, exactly zero. Zero, you know, they've done nothing. Actually, last year the European Union almost did, I don't know what happened to it. Out of hundreds, you know, it's not even a drop in the ocean. So, what getting back to the average daily intake or acceptable daily intake is set. The ADI is he basically that NOEL and then they say, "0h look we will divide it by ten or a hundred and that's safe and we'll work it out on that".

Well, the big trouble with that is now that you're going down to an even lower dose. If that chemical is an endocrine disruptor and works on a non-monatomic dose, a hundred times lower is actually be significantly more dangerous and more toxic. So, you think that they'd

actually test? No, so there's not one ADI, the thing that everybody says we're basing our safety on, where we actually have scientific testing at that level to show that it's safe.

So once again, no evidence-based science but when we go in once again into the independent literature by independent scientists published in peer-reviewed journals? We have a hundred showing that they are unsafe and very unsafe.