

Viewpoint: This guide should replace the Environmental Working Group's Dirty Dozen list of 'chemical-soaked' produce

The Toxic Ten are chemicals in your family's refrigerator and the government does nothing to stop it; it even takes steps to increase their level in food. They are prevalent in the American diet. Studies in animals have shown that they can pose a significant risk to health.

Human dietary toxicity from many of these compounds has been reported, and some exposures can be fatal. Some are concentrated and marketed directly toward children. More than 50,000 cases of poisonings from the Toxic Ten are reported to poison control centers every year. All are listed clearly in the [Hazardous Substances Data Bank](#).

Independent laboratory tests have detected the Toxic Ten across almost all fresh fruits and vegetables. The chemistries are ubiquitous and are present in sizable amounts even in organic produce.

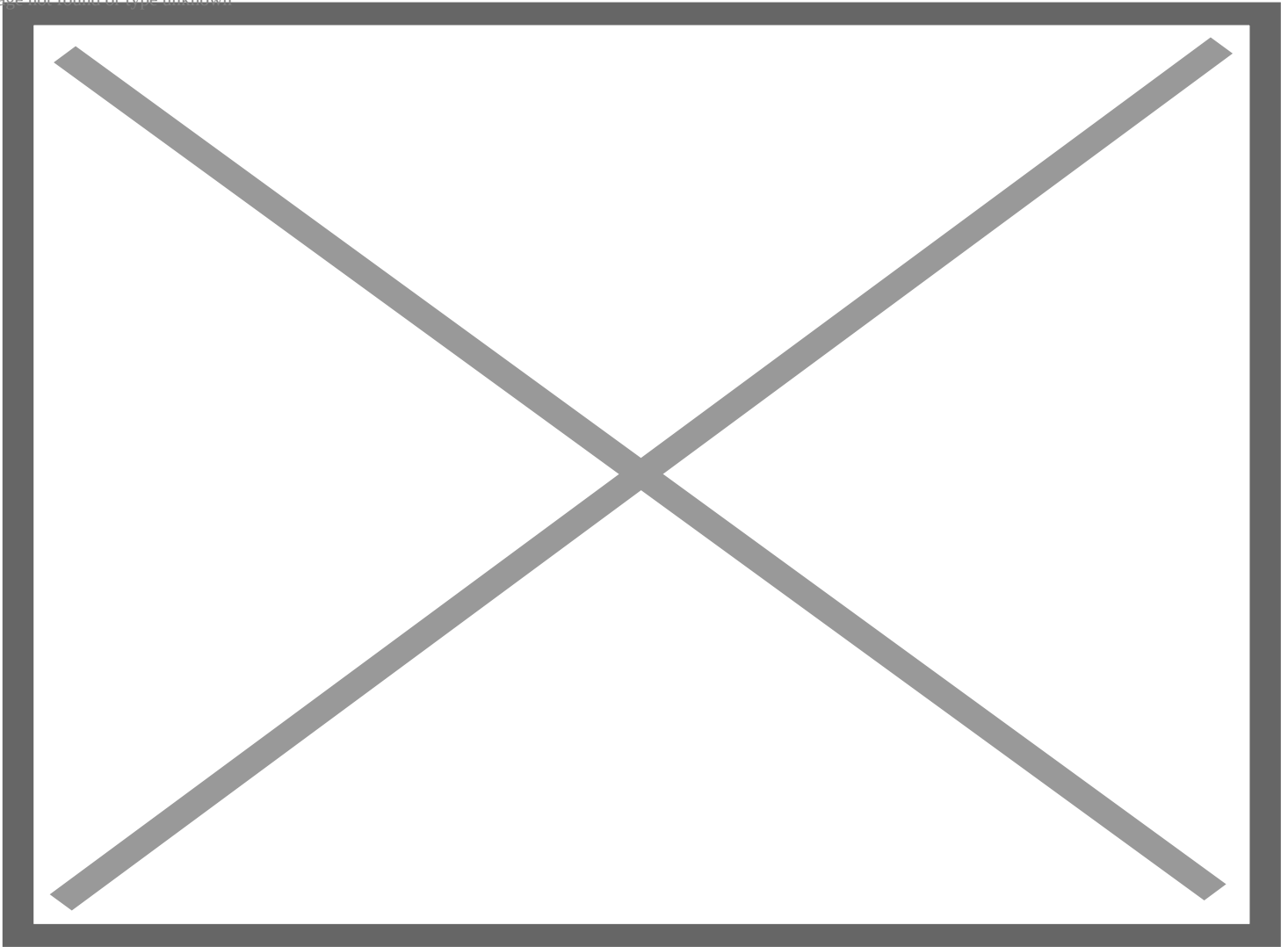
Levels in the EU are similar to those in North America. Worse, they cannot be washed from your produce. Studies have shown that it is possible to detect not just one, but *all ten* of these potentially dangerous compounds in any fruit or vegetable.

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Here is the Toxic Ten:

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- All-trans-Retinol (highest levels in carrots, leafy greens and tomatoes)

One of the most dangerous of the Toxic Ten, it is known to bind retinoid receptors and several studies have shown a link to pancreatic cancer, with potential roles in other cancers. Chronic exposure can lead to headaches and osteoporosis. Acute exposure is toxic to the liver, causing hair loss, skin detachment, problems with coordination, vertigo, nausea, fatigue, and severe headaches. Children are acutely susceptible to poisoning from this chemical.

- Alpha-Tocopherol (highest levels in sunflower seeds, almonds, spinach and avocados)

Alpha-Tocopherol, in rat studies, has been shown to target the heart, and pregnant mice treated with it had pups with slow growth defects and cleft palate. Neurotoxicity has been observed. There also is documented evidence of liver injury in humans, along with fatigue, blurred vision, vomiting, diarrhea and problems with blood coagulation.

- Ascorbic Acid (strawberries, broccoli, citrus)

Ingestion of this chemical can cause gastric irritation and diarrhea. It has been commonly identified in such common produce as citrus, strawberries and broccoli. It has “acid” right in the name, so clearly it is dangerous.

- Pyridoxine (highest in chickpeas, leafy greens, carrots)

This chemical has been shown to induce seizures, cause peripheral nerve sensitization, induce difficulty in walking and control of movements, convulsions, diarrhea and muscle weakness.

- Cyanocobalamin (detected in mushrooms)

It has been shown to cause blood clots, rashes, diarrhea, anaphylactic shock, and death. In mice, cardiac and respiratory failure has been reported. This chemical contains cobalt, a hazardous industrial element implicated in toxic groundwater contamination.

- Pyridine-3-carboxylic acid (found in peanuts, avocado and brown rice)

It has been reported to cause liver toxicity, rapid heart rate, jaundice, itching, fatigue and vomiting.

- Cholecalciferol (dietary supplement)

Also used as a rodenticide, it has been widely reported that multinational corporate giants are allowed to contaminate orange juice, oatmeal dairy products and almond milk with this chemical. It has been shown to cause problems in bone metabolism, deposits of minerals in the kidneys, constipation and diarrhea (probably not at the same time).

- Phylloquinone (dietary form of vitamin K found in green leafy vegetables like collard greens, kale and spinach)

It has been shown to induce jaundice and anemia, and in infants, can cause a defect in the breakdown of hemoglobin that can lead to brain damage.

- (2S)-2-[(4-[(2-amino-4-hydroxypteridin-6-yl)methyl] amino} phenyl) formamido] pentanedioic acid (folic acid green vegetables, beans, peas, nuts and many fruits such as bananas, melons and strawberries)

This chemical is present in 100% of leafy greens sampled. It has been shown to increase the risk of cancers, birth defects, stroke and heart attacks.

- Choline (found in beans, fruits and vegetables)

Specific levels of choline can cause vomiting, excessive sweating and salivation, and dangerous decreases in blood pressure. Choline can be toxic to the liver and at some levels can cause a fishy body odor.

This chart outlines hazards in some of the Toxic Ten

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Scared to death?

All the chemicals above (some which you can't pronounce) are found in your food—because they are all vitamins. The toxicity levels noted are real, determined from experiments conducted in animals as well as in Petri dish cell cultures.

We refer to them as A, C, D, B6 or similar nomenclatures, but those less scientific nicknames represent an elaborate chemical compound that has discrete thresholds for action and toxicity. Even vitamins, essential for life, have specific levels that should not be exceeded.

And in fact, they *can* be harmful—at levels far, far beyond what any human could possibly consume. But the only time these become toxic in practice is from supplement overdoses or accidental ingestion. In reality, it would be almost impossible to exceed risk thresholds from consuming fruits and vegetables.

The same holds true for the Environmental Working Group's Dirty Dozen list of 'toxic fruits and vegetables'; not one is harmful at the levels we encounter the chemicals on them (not even close in every case). Every chemical listed could be harmful if, as with our Toxic Ten, they are consumed at 100 to 1,000 times the levels we encounter them in our daily diets.

The point of the Toxic Ten is to illustrate how easy it is to conjure a sense of risk and fear around chemicals in or on our feed that are essentially riskless. If it's your intention, it's easy to almost scare people to death by what are comparatively harmless or even beneficial chemicals.

This is a critical teaching exercise on the heels of the EWG's Dirty Dozen. They exploit the same kind of word gymnastics and data distortion to imply risk around miniscule levels of chemicals used to protect crops from insects, fungi and weed pressure that don't come close to harming humans. We have very powerful methods to detect the presence of a specific chemical at the edge of nothing, but "detected" does not mean equate with dangerous. Not even close.

Don't make your diet decisions based on fear. Someone is trying to fool you—not to protect you but for their own ideological or financial gain.

Consumption of fruits and vegetables is associated with a decreased risk in long term developmental disease, as well as a better quality of life. We live in a time with the safest, most abundant supply of fruits and vegetables in human history. Enjoy them frequently and be grateful for the diversity we can access around the calendar.

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