

Viewpoint: The Environmental Working Group's "Dirty Dozen" list is a danger to public health put out by an organic industry funded activist group



he [Environmental Working Group](#) (EWG) is an anti-science activist organization.



Dr. Andrea Love

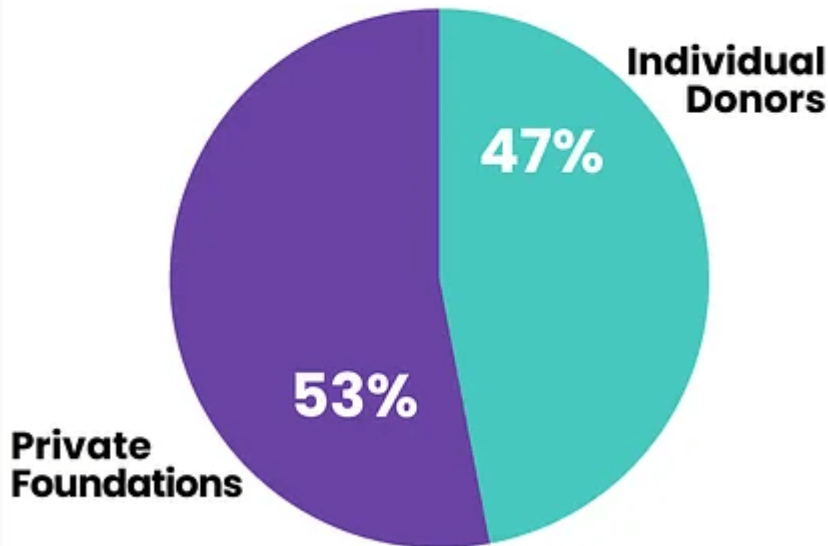
EWG is a 501(c)(3), which means for taxation purposes, the organization is run as a charitable organization. This does not inherently mean that the information it provides is accurate. 501(c)(3) status relates to funding sources and intent of the organization. EWG does not disclose all of its donors, but several include large organic farm organizations such as Earthbound, Stony Field, Organic Valley, and Applegate Farms who also voice opposition to biotechnology. EWG brings in \$13 million dollars a year that funds their disinformation campaigns.

The EWG action fund is the arm of EWG that is a lobbyist group. Lobbyists are professional advocates that work to influence political decisions on behalf of individuals and organizations. The EWG Action Fund lobbyists work to push their petitions through to public officials. Through this, their disinformation impacts health policy and our laws.

EWG routinely makes statements in opposition to the body of evidence and scientific consensus by experts.

The EWG has even made statements that promoted misinformation about vaccines causing autism.

EWG brings in an average of \$13 million dollars every year:



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[EWG is notorious for spreading fear about chemicals](#) and exploiting chemophobia, the appeal to nature fallacy, and low chemistry literacy. EWG routinely exaggerates risks to consumers, promotes products backed by their donors, and uses flawed methodology to make claims not backed by legitimate data. EWG issues product safety warnings that have no evidence to support them. [They are in opposition](#) to modern agriculture, biotechnology, and have even spread unfounded claims about vaccine safety. The accuracy of EWG reports and statements has been criticized by scientific experts. Its warnings have been labeled “alarmist,” “scaremongering,” and “misleading”.

While the EWG claims to help human health through research and by advocating for industry changes, in reality, they do the opposite.

EWG should never be utilized as an ‘expert source’ of information, even though they are routinely quoted by media outlets on topics related to chemicals and food.

Toxicologists and [other scientific experts](#) have [detailed their flawed](#) science and faulty research methodologies which they base their claims on.

- They routinely [make claims that are in direct opposition](#) to credible scientific and medical agencies, their methods are not supported by any legitimate scientific organization, and frequently cite studies that are not peer-reviewed.
- They exaggerate toxicological risks of chemicals, overstate potential impacts to human health, and take findings wildly out of context.
- Their methods routinely implement chemophobic messaging and appeal to nature fallacies and

- utilizes fear-based marketing to scare consumers away from products that are demonstrably safe.
- They frequently cherry-pick data that are favorable to their donor corporations, particularly claims related to unsubstantiated benefits of organic products and harms of gene technology, while simultaneously omitting more robust and relevant data.

The “science” EWG uses lacks credibility, but [preys on emotions](#) of consumers, leverages fear-based marketing, and coerces people into [buying specific products](#).

Their annual “Dirty Dozen” list is false claims intended to scare you from perfectly safe and nutritious produce.

The EWG creates lists of consumer products to ‘avoid’ that are routinely criticized by toxicological and scientific experts. These lists influence their readers on what they should and should not buy, based on unsubstantiated claims.

The most egregious? The Dirty Dozen.

According to the EWG, it is a list of 12 conventionally grown fruits and vegetables that “contain the highest levels of pesticide residues”, and as a result, you should buy organic versions of them instead. The EWG creates this list based on detected pesticide residues, using data on conventionally grown produce samples from the United States Department of Agriculture (USDA) reports.

[Organic produce](#) does not offer nutritional, safety, or ecological benefits compared to conventional produce.

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The problems with the Dirty Dozen?

Most people do not understand what a residue is.

Pesticide use in conventional farming is highly regulated, and safe tolerance levels are established for all of them. Pesticide residues on 99.5% of conventional produce are well below limits set by the EPA. More than that, half of samples on the “Dirty Dozen” list do not have ANY detectable residues.

The Dirty Dozen list is an inaccurate representation of the risk to our health from eating conventionally grown fruits and vegetables.

Detection does not equal clinical relevance.

This is a common strategy used by people who spread fear about certain chemicals (ironically, not other chemicals). Everything is chemicals. You're a sack of chemicals. The dose makes the poison with everything. EWG employees seem to have forgotten all of this. The [EWG's foundation of fear-mongering is based on wild exaggeration of 'detectable' chemicals](#).

We have some of the most sensitive analytical chemistry tools on the planet. That means, we can "detect" levels of substances that are miniscule. Parts per billion. Parts per trillion. For context: a part per billion (ppb) is one part per 1,000,000,000 parts. A part per trillion (ppt) is one part per 1,000,000,000,000 parts.

The EWG "method" for scoring produce items as "dirty" is completely flawed and created to scare people.

Their methodology in reporting 'dirty produce' is based on the number of different conventional pesticide residues, not the cumulative levels of residues. So, [by the EWG flawed methodology](#), if 10 pesticides are found each at 1,000 times lower the tolerance limit set by EPA, that fruit gets ranked as "dirty" while another produce item that has only one pesticide residue at a slightly higher 100 times lower the tolerance limit gets ranked as clean. Now, it bears mentioning that both of those produce items are safe to consume and are well below the pesticide thresholds set by EPA, but it underscores how inappropriate the EWG methods are.

1. If 10 pesticide residues are found at 1000 times lower than the tolerance set by EPA, that produce item is considered as "dirty".
2. If another produce item has only 1 pesticide residue at slightly higher levels but still 100 times lower than the tolerance limit, it is considered "clean".
3. The EWG ranks fruits and vegetables based on the number of pesticide residues present rather than the actual levels of pesticide residues.
4. Then, they claim these foods are unsafe, when the potential levels of residues are orders of magnitudes lower than could ever potentially be harmful.

In reality, none of the conventionally grown items on the EWG's "Dirty Dozen" list exceed pesticide thresholds that are set, tested for, and rigorously monitored. The claims they make are extremely misleading.

Organic pesticides are not included in this list, because they are not regulated for safety or efficacy by the USDA like conventional (synthetic) pesticides.

The EWG does not disclose that organic produce can contain organic pesticide residues as well as synthetic pesticide residues. Conveniently, EWG excludes organic produce from their list to scare people from purchasing conventionally grown produce and sway them to purchase organic produce.

The EWG fails to mention that organic produce also uses pesticides. Instead of synthetic pesticides, these are organic pesticides. However, while the EPA oversees testing of synthetic pesticides and toxicity prior to approval, none of that is required for organic pesticides – no toxicity testing, only guidance. Of course,

because the USDA surveillance is monitoring only synthetic pesticides, none of those are included in that list. But even more than that, [several studies have demonstrated that organic products *also* have synthetic pesticide residues](#), on top of the organic pesticides that are not monitored for safety or efficacy. The EWG fails to mention this in their report.

One of the biggest misconceptions about organic products are that they are pesticide-free. This is false.

Organic farming uses plenty of pesticides and fungicides. In fact, [there are over 20 chemicals commonly used in the growing and processing of organic crops that are approved by the US Organic Standards](#). But – the volume of chemicals used aren't recorded or monitored, which is surprising: pesticides deemed "organic" are less effective typically, so larger volumes are usually required.

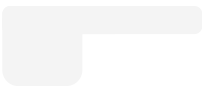
According to the [National Center for Food and Agricultural Policy](#), the top two organic fungicides, copper and sulfur, were used at a rate of 4 and 34 pounds per acre [in 1971](#). In contrast, the synthetic fungicides only required a rate of 1.6 lbs per acre, from 2.5X to 20X less than the amount of the organic alternatives. More than that, many of these organic pesticides are more toxic (when looking at LD50 values), especially when used at the higher levels required for adequate control.

LD50 values are a way we can measure toxicity – it refers to the dose of something at which 50% of the test group dies – the 50% lethal dose. Lower LD50 values means something has greater toxicity. Remember: you can't simply say something is toxic – the dose makes the poison. Toxicity includes dosage, which is often normalized to the size of a given organism too.

Natural pesticides refer to products that are derived strictly from sources in nature with little to no chemical alteration. Synthetic pesticides are products that are produced from chemical alteration. All pesticides are toxic (-cide means to kill) – and the dose makes the poison. In fact, some naturally procured pesticides are deadlier or carry a higher risk than synthetic options. [“Just because something is labeled organic or natural does not mean it is safer to the homeowner or unable to cause harm to the environment. Botanically derived pesticides are not always safer; in fact, some can be more dangerous.”](#)

Lots of things in nature are toxic, so let's cease and desist with the appeal to nature fallacy. There's a reason there is abundance of natural pesticides: plants and animals produce chemicals to deter insects and herbivores from eating them. Everything is chemicals and the source of a chemical does not dictate its safety. More than that, many have the potential to be more harmful to key pollinator species that we rely on, humans, and other animals.

Examples of organic pesticides include: Nicotine sulfate, Methyl bromide, Copper sulfate, Sodium hypochlorite, Gibberellic acid, Chlorine dioxide, Peracetic acid, Sodium carbonate peroxyhydrate, Lime sulfur, Azadirachtin, Spinosad, Calcium hypochlorite, Veratran D, Lignin sulfonate, Ferric phosphate, Copper oxychloride, Hypochlorous acid, Potassium hypochlorite, Rotenone, and Pyrethrins.



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Because organic pesticides are not permitted to be altered to improve specificity or biodegradability, many organic pesticides are less effective, can bioaccumulate more, and have worse ecological impact by killing non-target species, many of which can be natural predators of the target pest in question.

For example, [organic pesticides used for aphids can kill multicolored Asian lady beetles and insidious flower bugs](#), both of which are natural predators of aphids. Many require much higher concentrations to be applied to have similar impacts as conventional pesticides.

Nicotine sulfate: Nicotine is natural, and thus approved for organic farming to control aphids, thrips, mites and other insects. It is amusing to have seen so many pro-organic campaigners arguing against the use of neonicotinoids by saying that these synthetic pesticides were using nicotine. Yes BUT so were organic farmers. But how toxic is this natural, organic-approved neurotoxin? Very (LD50: 50-60 mg/kg). In the US, nicotine sulphate carries a Danger warning. It is an organic neurotoxin that [interferes with the transmitter substance between nerves and muscles](#). Tests have shown that nicotine sulphate has caused abnormalities in the offspring of laboratory animals and a [New Jersey State study](#) revealed that nicotine sulphate poisoning of organic gardeners can lead to increased blood pressure levels, irregular heart-rate, and, in certain cases, death.

Rotenone: occurs naturally in the seeds and stems of several plants, such as the jicama vine plant, and has been used copiously for decades. Touted as being 'natural', is [extremely toxic at relatively low doses](#). Was temporarily discontinued as pesticide from 2005 to 2010 in US, but was re-approved in 2010. It is also routinely used as a piscicide in fishery waters.

Pyrethrins are derived from chrysanthemum flowers. They act as neurotoxins in all organisms, but are [particularly neurotoxic to bees and other insects](#), many of which are key pollinator species. They can also be neurotoxic to mammals (including humans).

Copper sulfate: [used as "organic" fungicide](#). Copper sulfate has significantly higher toxicity than synthetic alternatives. The LD50 (50% lethal dose) of copper sulfate is 300 mg/kg versus the synthetic alternative Mancozeb (4500-11,200 mg/kg) — which means that copper sulfate is at LEAST 15X more toxic, and needs to be used in LARGER quantities compared to synthetic alternatives. Not only is copper sulfate toxic to fish, humans, and other species, but it also persists in groundwater and the environment long-term.

A [study in Environmental Research](#) claimed that people who switched to organic foods primarily had a decrease in urine output of pesticides – but they ONLY looked at pesticides in conventional farming, not organic pesticides. Of course it stands to reason you're not going to detect things you're not testing for!

The risk of not eating fruits and vegetables is much more of a concern to our health than the likelihood of consuming trace amounts of pesticide residue. This is concerning since [most of us already don't eat enough fruits and vegetables](#). Ultimately, the EWG report negatively affects our shopping decisions with baseless information that preys on our fears, when it is not based on any valid scientific information.

The false dichotomy between conventional and organic isn't just misleading, it's dangerous. Our constant attention to natural versus synthetic only causes fear and distrust, when in actuality, our food has never been safer. [Eating less fruits and vegetables due to fear of pesticides or the high price of organics does far more harm to our health](#) than any of the pesticide residues on our food. [Conventional produce has the same nutritional content](#) and is as safe to consume as 'organic' produce.

Why do we even use pesticides?

Pesticides and herbicides added to crops reduce exposure to and damage by unwanted insects, bacteria, fungi, and weeds. If we did not utilize pesticides for agriculture, yields of farm crops would be impacted, cost of food goods would skyrocket, and we would not be able to feed the 8.1 billion people on the planet. Organic farming uses 84% more land for the same yield, but yields are 55% lower by area than conventional.

All chemicals can pose health risks when they are in larger concentrations. Yet, toxicology experts have investigated the pesticide levels in the Dirty Dozen and have concluded:

The methodology used by the EWG to rank the fruits and vegetables with respect to pesticide

risks lacks scientific credibility.

Substituting organic forms of the ‘dirty dozen’ foods for conventional forms does not reduce consumer risks.

Exposure to the most commonly detected pesticides on the ‘dirty dozen’ fruits and vegetables poses negligible risks to consumers.

The EWG cherry-picks and misrepresents information, and ultimately negatively impacts consumers by scaring them about conventionally grown foods. Conventional produce has the same nutritional content and is as safe to consume as ‘organic’.

There are [no credible data](#) to suggest avoiding conventional produce items on the “Dirty Dozen” list offers any health benefit.

Save your money and your sanity, and avoid being scared by the EWG and [their false list of ‘dirty’ produce](#). And while you’re at it, don’t trust anything the EWG says – it is all based on unsubstantiated claims intended to scare you, all [exploiting the risk perception gap, which I discussed here](#).

Dr. Andrea Love, a microbiologist and immunologist, is a public health consultant and science communicator. Follow her at [ImmunoLogic](#) and read her articles on [Substack](#). Find Andrea on X [@dr_andrealove](#)

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