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Are Pesticides *Good or Bad?*

By Gabriel Labrecque

CONTROLLED POISON: A BRIEF HISTORY OF PESTICIDES

It's a universal truth that the strong survive. Those who adapt best to their surroundings contribute more to the gene pool by being stronger, more resilient, and having more offspring. This has been a selective force in nature since the beginning of time- and one often influenced by occasionally random events (earthquakes, floods, asteroid strikes).

Human beings took a step beyond these random reactions to their environment when they began agriculture. They chose certain plants to artificially protect and nurture, and then they again chose certain descendants of those plants to continue the process. Choosing to foster a crop that could produce large yields, or withstand cold/heat started to manipulate the environment- and it made sense. Having at least part of your food planned out in advance must have been a great comfort to ancient humankind. Considering that it has been a feature of multiple civilizations for thousands of years, it has definitely paid off.

The only problem is keeping other things from

eating our food while it's growing.

Humans have incorporated chemical deterrents to their food crops for millennia, stretching all the way back to ancient Mesopotamia. As time passed and human knowledge expanded, our usage of these deterrents, these 'pesticides' has changed and developed as well.

From sulfur to arsenic, mercury, and lead our crops have been treated to kill unwanted insects, animals, weeds, and fungi for generations. As our population has expanded, the need for greater and more nutritious crop yields has put more pressure on our farmers. By treating their fields, they not only protect their investments, they also defend against potential famine.

That's a rather terrifying amount of responsibility.

The crux of the problem lies here: how much are pesticides strictly necessary, and how much constitutes poisoning to the general public? Where and what lines do we draw between protecting our species and polluting our environment?

Are pesticides good or bad?

There are no easy answers here.

WHAT IS A PESTICIDE?

Just to complicate matters more, the word 'pesticide' covers an immense group of toxic chemicals- not all of which are intended for agricultural purposes. A 'pest' in this sense could be an undesirable plant, animal, fungus, or microbe. Bug spray is a pesticide. So are ant bait traps you find in many households.

Even more confusing is the way language is used to describe these compounds. 'Synthetic' chemicals are ones that are strictly man-made. 'Organic' chemicals aren't necessarily harmless, natural ones- they're simply ones that contain the element carbon. 'Organic farming' has given a confusing secondary definition to this term- but organic pesticides can be every bit as dangerous as synthetic ones. 'Natural' pesticides also exist- and even though they are naturally occurring chemicals, they are as regulated and monitored as the artificial ones.

These chemicals can have some terrifying effects on our bodies and our environment. That doesn't mean they're all bad. It also doesn't mean that using them excessively is a great idea either. To get a better idea of the implications of their usage, a little background is needed. We need to meet Paul Muller.

WHO IS PAUL MULLER?

Here's one of those pivotal moments in history. Next to no one knows who Paul Muller is- though he and his discovery are justifiably famous. He's no other than the Nobel Laureate for Medicine and Physiology for 1948. A learned man, certainly- and a talented scientist. One who is singlehandedly responsible for saving millions of lives.

Sort of.

Yup. He got a Nobel Prize for that- but context is everything here. At the time, discovering a cheap, easily made pesticide that didn't wash off and (apparently) didn't harm mammals was nothing short of miraculous. It was used in agriculture, resulting in larger yields. It was used to de-louse soldiers in World War II. It didn't need to be constantly re-applied. Here's the kicker- and the reason why Muller won the Nobel Prize:

Added to a water supply, it killed mosquitoes.

Now, this is largely a nuisance in North America- but it had an immense impact on the undeveloped world, where mosquitoes can carry a deadly cocktail of malaria, dengue fever, sleeping sickness, and yellow fever (just to name a few). Yearly, between 1 and 3 million people die from malaria alone. DDT was a miracle.

Until it wasn't.

DDT (dichlorodiphenyltrichloroethane) belongs to one of three main families of pesticides; in this case, organochlorines. Most of these pesticides have been proven to be highly toxic to not just the target insects, but also to all vertebrates as well. In light of this evidence, DDT is now largely banned worldwide, with just a very few (malaria-ridden) exceptions in the third world.

Thanks to the Stockholm Convention of Persistent Organic Pollutants, DDT and eight other incredibly deadly pesticides are prescribed in over 100 countries worldwide.

The other two families of pesticides are organophosphates and carbamates. Although these are less aggressively toxic than organochlorines, they are still dangerous and subject to strict regulation and regular environmental impact reviews.

The combined adverse effects of using these deadly poisons outweigh their benefits in most parts of the world. The environment and its fragility are paramount- as are all of its inhabitants. The target organism of these pesticides rarely stops at just that one focus, and the repercussions of unwise decisions can be widespread and unexpected.

WHO GETS HIT HARDEST?

Most pesticides, no matter what their chemical composition, all concentrate their most deadly effects on the nervous system. By disrupting the smooth functioning of nerve fibers on a molecular level, they can, at high concentrations cause weakness and paralysis. Lower exposure can result in lack of coordination, memory issues, decreased motor skills, and altered mood and behavior.

There are a few important sections of the population that are at highest risk for pesticide poisoning.

Farm laborers and chemical plant workers are at the forefront, being in constant contact with these substances. Official agencies have done their best to help protect these people, with extensive education, labeling, training, and intervention being the norm. Access to chemicals like these is rigidly enforced- to avoid both accidental and intended cases of poisoning. Worldwide, there are 3 million reported cases of pesticide poisoning a year, and 220 000 deaths (some deliberate suicides). Health and safety standards are rigorously enforced- but chemicals still enter the environment, and still cause problems with workers.

The second population is more disturbing: children. Due to the fact that they consume more food, water, and air per square inch than adults, they are much more susceptible to the adverse effects of pesticide poisoning. Their accelerated rate of growth ensures that any absorbed toxins are retained and continuously affect their bodies. There has been some evidence that children exposed to pesticides in the womb are much more likely to develop ADHD later in life, as well as neurological and other systemic issues. Clearly, this is not a tolerable situation.

Even worse, in the 1970s, it was discovered that human breast milk contained an astounding concentration of DDT- so much that it would have been illegal to transport it commercially across state lines. DDT isn't such an issue in America anymore- but the idea of nursing one's child with poison-laced milk is nightmarish. Breast milk is still best for infants- the scientific community is unanimous on this. The fact that the incidental toxins we absorb are concentrated into the food our infants consume is alarming.

A combination of national and international standards, laws, and agreements have made the world much safer for today's children. The most dangerous pesticides are no longer produced or are heavily regulated for the protection of both people and the planet.

CHEMICAL INTERVENTION AND TODAY'S AGRICULTURE

So where does that leave us today? The systemic effects of DDT on the human body and the environment are well documented (and predicted in Rachel Carson's 'Silent Spring' released in 1962). Certainly, the old ways of pest control cannot continue in the face of neurological issues, infertility, mood disorders, and liver dysfunction.

Between the World Health Organization (WHO), the Environmental Protection Agency (EPA), the Food and Drug Agency (FDA), and the United States Department of Agriculture (USDA) some pretty stiff guidelines have been set out to protect the general public.

Different chemicals are now used, including an

expanding field of 'biopesticides' (also known as botanicals). Extracts from chrysanthemums and tobacco plants are now being used to deter pests- and have been gaining in popularity. Modern chemistry is still seeking a non-toxic toxin if such a thing can be found.

Concentrations of toxins still vary greatly between different crops, and between origin countries. Unfortunately, it would seem that you need a degree in chemical engineering and the luck of a Vegas card shark to choose what foods to include or exclude from your diet. There are a lot of variables out there!

There are some straightforward strategies available to make careful, informed choices in the produce you consume. First and foremost is this: no matter what, it is still better to consume whole, natural food than processed (and even more chemical-laden) foods. Washing and peeling both help to remove some of the toxins. In several cases though, a conscious choice of what you eat and where it comes from has to be made. Some toxins can only be avoided by avoiding the contaminated food altogether.

LOCAL OR ORGANIC FARMING?

There have been huge strides made in recent years to revitalize the idea of the smallholding farmer- cooperatives have sprung up, while farmers' markets have experienced a boom in popularity. Locally grown, though, doesn't necessarily ensure that your produce is pesticide free- it simply means that you are spending back into your local economy. While this is a worthwhile pursuit, a small-scale farmer can use the same kind of chemicals as large-scale monoculture farms. Given the immense pressure put on them, one can hardly fault a hard-working farmer wanting to protect his investment.

The wisest course of action is to simply ask your local farmer. Depending on what kind of crop, when it was treated, and with what substance the end result can be wildly different. A very small dosage of pesticide at a critical point of a pest's life cycle can make further interventions unnecessary. Well educated farmers know their land, its limits, and how to best preserve its fruitfulness. It is their livelihood, after all.

Organic farming is a very safe bet if you're seeking produce with the least amount of chemical intervention. In order to be certified

organic, produce must be grown under very strict conditions, with a very limited amount of chemical intervention allowed (there are a very few natural deterrents allowed in organic farming- ones that largely break down into harmless components quickly).

Keep in mind that even on organic farms, a minuscule amount of aerial drift is possible from nearby non-organic farms. Standards for organic farming have taken this into account, and only those crops with the most incidental of contact are allowed to bear the label 'certified organic'.

CONVENTIONALLY GROWN FOODS: WHEN ARE THEY OKAY?

Different crops require different amounts of intervention- so depending on what's being grown and where, different amounts and types of pesticides are applied. In the United States, there are some fruits and veggies that have acceptably low concentrations of pesticides (ie. of such low amounts as to have little or no effect on consumers), and some that carry a rather larger payload.

In some cases, it's best to buy organic for the safest, most healthy option. In other cases, conventional is perfectly fine- but country of origin must be taken into account. All grocery stores are required by law to post country of origin with its fresh produce. In many cases that makes an immense difference.

PESTICIDE CONCENTRATION: THE WORST FOODS

This is far from a comprehensive list and refers largely to domestically- grown foods. If you can afford an organic option to any of these it would be a good investment in your long-term health.
-apples -strawberries
-grapes -celery
-peaches -spinach
-bell peppers -nectarines
-cucumbers -snap peas
-potatoes -hot peppers
-blueberries

NOT-QUITE-ORGANIC...BUT SAFER

Looking at country of origin can make a huge difference in this overall list- and potentially open up a little wiggle room in your choices and your wallet. If you can't make a full commitment to organic produce, there are some reasonable midway compromises you can make. Different countries, with different growing seasons, climates, and pests require different amounts of intervention. Check out produce from these relatively safe international destinations.
Canada- cucumbers, potatoes, tomatoes
New Zealand- apples
Mexico- snap peas, winter squash

CONVENTIONAL, AND GUILT-FREE

America is still a very fertile and abundantly producing nation. Though we use a lot of chemical intervention, there are many crops that simply don't need to be messed with. Check out these healthy conventional options:
-avocados -sweet corn
-papayas -kiwi
-pineapple -cabbage
-onions -asparagus
-mangoes -eggplant
-grapefruit -cantaloupe
-cauliflower -sweet potatoes

SO... ARE PESTICIDES GOOD OR BAD?

In this day and age, avoidance of all chemical influence is virtually impossible. If you don't eat chemicals, you drink them or inhale them. It's

your own choice which ones you decide are reasonable to accept into your diet. Overall, the best strategy to deal with the debate of what is safe to eat falls back on the most basic of dietary advice:

Eat a wide variety of all fruits and vegetables.

Load up on your food rainbow. Choose organic when you can- but by eating the widest variety of foods possible, you not only incorporate innumerable micronutrients into your body, you minimize the effect any one given chemical, toxin, or pesticide has on your overall health. By hedging your bets, you can still have a completely and joyfully varied diet- one that is simultaneously delicious and avoids overt exposure to adverse chemicals in your environment.

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ABOUT THE AUTHOR

Hi! I'm Gabriel. Canadian Food Blogger. Father, recipe developer, writer, and photographer. The philosophy behind my work is to promote the use of "real food" instead of traditional unhealthy ingredients. Looking for simple & delicious Paleo, Vegan, Gluten-Free or Whole 30 friendly recipes? I got you covered! I believe that good health starts in the kitchen. I create delicious recipes made out of real ingredients and share my knowledge about nutrition to support you on your Journey to a healthier living. Follow Gabriel at- www.OneCleverChef.com