

**GROW HEALTHY BABIES**

**PART III**

**AVOIDING  
CHEMICALS:  
THE CASE FOR  
ORGANIC AND  
ECO PRODUCTS**

## CHAPTER 8

# HOW GOING ORGANIC BENEFITS YOUR BABY

If you took away only one thing from reading this book, it should probably be the importance of minding your microbiome. As you saw in chapter 3, that means avoiding unnecessary antibiotic prescriptions. But did you know that the food we eat is constantly exposing us to antibiotics as well? Below, I'll explain how, and what you can do about it.

### ANTIBIOTICS IN ANIMAL FARMING

Animal farming is by far the biggest user of antibiotics worldwide. In the United States, more than 80 percent of all antibiotics are given to farm animals. And it's not to protect piglets from sore throats—the antibiotics are used to fatten up the animals so the meat can be produced faster and more cheaply. In a darkly ironic twist, those same antibiotics are coming back to fatten *us* up as well. Researchers now believe that antibiotic residues in farmed meat are contributing to the obesity epidemic in Western societies by tilting our microbiome towards bacteria that disrupt our metabolism and make us obese.<sup>438</sup>

Most antibiotics given to animals are completely unnecessary from a medical point of view, and they add fuel to the fire of the global antibiotic resistance crisis. On US supermarket shelves, more than 80 percent of turkey, 70 percent of pork, 55 percent of ground beef, and 40 percent of chicken contain antibiotic-resistant bacteria like *Salmonella*, *Campylobacter*, and *E. coli*.<sup>439</sup> Farmed fish and shellfish don't fare much better. Around the world, antibiotic use in animal farming is projected to rise by another 67 percent in the next fifteen years, and studies are showing that the more antibiotics are used in farming, the more antibiotic-resistant superbugs spread to humans.<sup>440</sup> Cooking the meat or fish does nothing to inactivate or remove the antibiotic residues,<sup>441</sup> so we're constantly consuming them in small, so-called subtherapeutic, doses. The risks of this have long been well-understood. Consider this warning (issued in 1945, no less!) by Alexander Fleming, the discoverer of penicillin, in his Nobel Prize acceptance lecture: "There is the danger that the ignorant man may easily underdose himself and by exposing his microbes to non-lethal quantities of the drug make them resistant."<sup>442</sup>

How big of a problem is this? The World Health Organization calls antibiotic resistance "one of the biggest threats to global health today."<sup>443</sup> Without efficient antibiotics to combat pathogenic bacteria, medicine could plunge back into a dark age where people routinely died from pneumonia, tuberculosis, or blood infections from even the smallest scratches. This wasn't so long ago—the age of antibiotics only began in 1940.

The first-ever patient to receive an antibiotic—penicillin—was a forty-eight-year-old Oxford police constable named Albert Alexander who had scratched his face working in his rose garden. The scratch became infected with *Streptococci* and *Staphylococci*, and the infection spread to his scalp, shoulder,

eyes, and lungs. Albert was on the verge of death when Dr Howard Florey, a pathologist at Oxford University, heard of his case. Florey's lab had been working on turning penicillin into a usable drug—for which Florey would later receive the Nobel Prize together with Fleming. Florey decided to administer the first available doses of penicillin to Alexander, who started to recover. Yet, after five days, Florey's supply ran out. It took 2,000 litres of mould culture to manufacture a single dose of penicillin, and Florey's lab wasn't yet able to manufacture the drug fast enough. Alexander's infection returned with full force, and he died three days later.<sup>444</sup>

This is what our children's future could look like. Alexander's fate is a warning for our own: we were given lifesaving drugs for a while, but they could be taken away from us again. Even worse, we are squandering one of medicine's greatest gifts on cheaper sausages and burgers. Rivers all over the world, including Europe, are "awash with dangerous levels of antibiotics" and farming pesticides, in some cases 300 times over the safe limit.<sup>445,446</sup> A 2016 UK government report estimates that if nothing drastic is done to tackle antibiotic resistance, it will cause 10 million deaths *every year* by 2050.<sup>447</sup>

And this is where organic food comes in—it is farmed without the routine use of antibiotics. It's also much lower in pesticides and has a number of other health benefits.

## IS ORGANIC FOOD REALLY HEALTHIER?

In short, yes, it is. Organic food *is* healthier and more nutritious than conventional food.

Two meta-analyses (of 67 and 170 studies, respectively)

demonstrated that organic meat and dairy contain more polyunsaturated fatty acids than conventional meat and dairy.<sup>448,449</sup> In particular, they contain roughly 50 percent more Omega-3 fatty acids, which—as you saw in chapter 5—are anti-inflammatory and crucial for brain development in children.

The same goes for organic fruit and vegetables. According to a meta-analysis of 343 previous studies, organic produce contains roughly 20–70 percent more antioxidants like phenolic acids, flavanones, stilbenes, flavones, flavonols, and anthocyanins.<sup>450</sup> These prevent DNA and cell damage by neutralising free radicals. Antioxidants have a wide range of health benefits: they lower your risk of cancer, heart disease, age-related eye lens degeneration, and Alzheimer’s disease—but only if you get them from your diet, not from supplements. The likely reason is that antioxidants in food are more balanced and complementary than in high-dose supplement antioxidants, as well as having a different chemical composition than industrially produced ones (e.g., there are eight different types of vitamin E in foods but only one type of vitamin E in supplements).<sup>451</sup> It also appears that dietary antioxidants help to balance your gut microbiome.<sup>452</sup> Moreover, organic produce benefits your microbiome in another important way: it provides you with a bigger bacterial diversity because of the higher biodiversity and quality of the soil in which it is grown.<sup>453,454</sup>

But wait a minute. No doubt you have regularly come across articles in the media or on your friends’ Facebook feeds, which gleefully “bust the myth” that organic foods are any better for you. Look at those do-gooder hippies overpaying for their precious kale! The most prominent wave of these articles was based on a 2012 Stanford study<sup>455</sup> which generated headlines like “Organic Food ‘Not Any Healthier’” (BBC), “The Organic

Fable” (*New York Times*), and “Save Your Cash? Organic Food Is Not Healthier” (*New York Daily News*). Not to be outdone, the *Daily Mail* topped it with, “*If the smug organic mob get their way, millions of families will never again be able to afford roast chicken for Sunday lunch.*”

All throughout these media stories, the authors of the Stanford study claimed that there “isn’t much difference between organic and conventional foods.” However, their own study clearly showed that eating organic foods reduces exposure to pesticide residues and antibiotic-resistant bacteria.<sup>456</sup> According to their own data, only 7 percent of organic foods had pesticide residues versus 38 percent of conventional foods (besides, pesticides in conventional farming are much more toxic than the pesticides allowed in organic farming). Yet, this wasn’t the only interesting finding they glossed over: their own data showed that organic foods are significantly higher in brain-boosting Omega-3 fatty acids. Finally, but perhaps not coincidentally, the Stanford authors neglected to mention that Cargill, one of the biggest conventional food producers in the world, had funded their department with more than \$5 million<sup>457</sup> and that their statistician, Dr Ingram Olkin, had been employed by the tobacco industry to disprove the health risks of smoking.<sup>458</sup>

In response to the media frenzy, other researchers pointed out how their own findings contradict the Stanford study.<sup>456,459</sup> Considering how much *more* pesticide residues there are on conventional foods, and how much more *toxic* these are than the pesticides approved for organic farming, they estimate that eating organic foods reduces health risks from pesticide exposure by 94 percent. And these health risks, I’m sorry to say, are considerable.

Pesticides accumulate in our bodies over time and cross the

placental barrier during pregnancy. In one small study of twenty newborns in New York, every single one of them had detectable levels of multiple pesticides in their bodies.<sup>460</sup> Pesticides are hormone disruptors which trigger harmful epigenetic changes in foetuses and infants, and their dangers have been documented in dozens of studies. Pesticide exposure before and during pregnancy as well as in early childhood:

- Increases the risk of spontaneous abortion, birth defects, and infant death.<sup>461–463</sup>
- Increases the child's risk of all common childhood cancers, like leukaemia, brain and central nervous system tumours, neuroblastoma, kidney cancer, and lymphoma.<sup>464</sup>
- Impairs the child's brain development and intelligence.<sup>465–467</sup>  
A Californian study measured mothers' blood levels of organophosphate pesticides during pregnancy as well as their children's IQ scores by seven years of age. The children of mothers with the highest pesticide blood levels had an IQ score that was, on average, seven points lower than the children of mothers with the lowest pesticide blood levels.<sup>466</sup> In Europe, a comprehensive review released by the EU Parliament estimates that the reduction in children's IQ scores caused by prenatal pesticide exposure costs European countries €125 billion per year.<sup>468</sup>
- Increases the child's probability of attention-deficit hyperactivity disorder (ADHD), depression, and other mood disorders.<sup>464</sup>
- Decreases the child's lung function and increases the risk of asthma.<sup>469–472</sup> Another Californian study showed that a child's asthma risk roughly doubled when exposed to pesticides, and tripled when exposed to herbicides, in the first year of life.<sup>472</sup>



Most of these studies were based on pesticide exposure from living near conventionally farmed agricultural fields, so the exposures were almost certainly higher than you would receive from your diet. Nonetheless, according to the American Academy of Pediatrics and a whole pile of research, the main source of pesticide exposure for most children and adults *is* their diet, i.e., the pesticide residues on conventional foods.<sup>473–477</sup> This research also shows that switching to an organic diet for just *five days* reduces traces of pesticides in children’s urine to undetectable, or nearly undetectable, levels<sup>476</sup> and that pesticide levels in adults’ bodies can be predicted from how much organic versus conventional food they eat.<sup>474</sup> Consequently, a French study involving nearly 69,000 people found that, all other things being equal, eating mostly organic foods rather than conventionally farmed foods reduces your general cancer risk by 25 percent.<sup>478</sup>

Other “debunking organic” news stories claim that organic farms use just as many pesticides as regular farms, with the only difference being that those pesticides are of natural origin, which doesn’t automatically make them safer or healthier.<sup>479,480</sup> There is a grain of truth to the second part of the claim but not the first. Yes, organic farms *occasionally* spray natural pesticides, and *some* of those pesticides (e.g., copper) can be quite toxic to humans or the environment. However, the most-used pesticide in organic farming is *Bacillus thuringiensis* (Bt), a naturally occurring soil bacterium which is toxic to pest insects but non-toxic to humans and other wildlife.<sup>481,482</sup> Compare that to the well-documented toxic effects of conventional pesticides mentioned above! As for the claim that organic farmers spray just as much pesticides as conventional ones, sorry, that’s plain wrong. The rules for organic certification vary by country, but in general, organic farmers are only allowed to spray pesticides as

a last resort, after ecological methods of pest control (like crop rotation, insect predators, nutrient management, mechanical weeding, physical barriers, and traps) have failed—and organic farmers have to prove this by keeping meticulous records and submitting to annual on-site inspection by organic certifiers.<sup>483</sup> So it's no surprise that a Greenpeace study found pesticide residues on 81 percent of conventional fruits and vegetables, but only on 13 percent of organic produce.<sup>484</sup> Even the “anti-organic” Stanford study supports this finding.

And what about the argument that organic farming is unsustainable, if not *immoral*, because it would be unable to feed a growing world population? “Organic debunkers” and “myth busters” like to claim that organic farming has lower yields than conventional farming.<sup>479,480</sup> But scientific studies comparing the yield of nearly 300 different farm crops disagree: the yields of organic farming are similar to conventional farming, up to 40 percent higher in times of drought, use 45 percent less energy, and produce 40 percent fewer carbon emissions—all while being less polluting and less harmful to wildlife.<sup>485,486</sup>

At the same time, advocates of genetically modified crops had promised that GMOs would increase crop yields and reduce pesticide use. This promise has been broken. In US farming, where GMOs are used extensively, pesticide use has *increased*, whereas it has declined in countries where GMOs are not permitted like France. The growth in US crop yields, meanwhile, has merely kept pace with crop yields in Europe, despite Europe not embracing GMOs.<sup>487</sup> Based on evidence like this, the United Nations Human Rights Council calls for “a fundamental shift towards eco-farming,” stating that “scientific evidence demonstrates that agroecological methods outperform the use of

chemical fertilisers in boosting food production.”<sup>488</sup> The UN experts’ message is plain and simple: the idea that pesticides are necessary to feed the world population is a myth, fuelled by the aggressive lobbying and public relations tactics of chemical companies who earn more than \$50 billion per year from pesticides and fertilisers. What’s more, our farming output is already sufficient to feed 9 billion people, which is 1.3 billion more than the current world population. The cause of world hunger is not insufficient farming output but a problem of food waste, poverty, and inequality.<sup>489</sup>

## **WHAT IF ORGANIC FOOD IS TOO EXPENSIVE?**

It’s true that organic food is more expensive—even after buying mostly organic food for a decade, I still sometimes gulp at the price difference. There are, of course, good reasons for it: organic food takes more work to produce and uses more expensive inputs. For example, animals aren’t artificially fattened up with antibiotics, so they grow more slowly and don’t become as big. They receive higher-quality feed, which also has to be from organic sources. They require more space, as they are raised free-range with access to land for grazing and movement. To grow organic fruits and vegetables, farmers use more labour-intensive crop rotation, hand weeding, or cover crops to control weeds. As mentioned earlier, pests are controlled with insect predators (e.g., ladybugs which eat aphids, beetles, mites, and other pests), traps, physical barriers, and with organic pesticides only being sprayed as a last resort.

Another way to think about it is this: ask not why organic food is so expensive but ask why some conventional food is so cheap. It may not be you, but someone is paying the price for the difference. It could be animals raised in appalling conditions on

industrial farms, exploited farmworkers in developing countries, bees dying from pesticides, or the soil and the sea being polluted by agricultural chemicals.

Our food choices impact the world we want to leave to our kids. Insect populations are crashing on a global scale, which threatens not just human food supply but all living things that rely on them for food and pollination—a “catastrophic collapse of nature’s ecosystems.”<sup>490</sup> Moreover, we are facing climate change that will bring drought, floods, and extreme heat.<sup>491,492</sup> Organic farming can help us avert these disasters. Industrial agriculture and pesticide use are the main reasons for the decline in insect numbers. Thus, buying organic foods can make a difference in saving bees and other insects.<sup>493</sup> Likewise, a recent headline in the *Guardian* put it thusly: “Our best shot at cooling the planet might be right under our feet.” Organic farming restores degraded soil, and as the soils recover, they *actively start pulling carbon dioxide from the air*. Studies estimate that a large-scale switch to organic and regenerative farming methods could offset 3–15 percent, perhaps even as much as 40 percent, of annual carbon emissions.<sup>494,495</sup>

If it isn’t possible for you to go fully organic, the Environmental Working Group releases an annual list of the “Dirty Dozen” fruit and vegetables which are most heavily sprayed with pesticides (available at [www.growhealthybabies.com/ewg](http://www.growhealthybabies.com/ewg)).<sup>496</sup> If you just switched this produce to organic, you would already avoid the worst offenders. Here are the “Dirty Dozen,” in order of the most pesticide residues to the least:

- Fruit: strawberries, apples, nectarines, peaches, grapes, and cherries.
- Vegetables: celery, spinach, tomatoes, bell/hot peppers, cherry tomatoes, and cucumbers.

According to the Centre for Science and Environment in India, you can also wash off about 75–80 percent of pesticide residues with a 2 percent salt water solution (about one teaspoon of salt per cup of water) and thoroughly rinsing in cold water.<sup>497</sup> Alternatively, you can wash the produce with a vinegar solution. Peeling fruits and vegetables helps as well, of course.

The Environmental Working Group also has a list of the “Clean Fifteen,” the conventionally grown fruits and vegetables with the *least* amount of pesticide residues.<sup>498</sup> They are:

- Fruit: avocados, pineapples, mangos, papayas, kiwi, honeydew melon, grapefruit, and cantaloupe.
- Vegetables: sweet corn (though in the United States they are often GMO), cabbage, frozen sweet peas, onions, asparagus, eggplant, and cauliflower.

Another great way of accessing affordable organic food is buying from local farmers’ markets. Buying directly from farmers means you don’t have to pay middlemen like distributors and supermarkets, and you support local and sustainable agriculture. In our old Amsterdam neighbourhood, we had a fantastic organic farmers’ market where we became members of the cooperative running the fruit and veg stand. Once every quarter, you had to help with setting up the market stall and selling the produce, and in return you permanently received a 20 percent discount on all the goods. Our food bill went down dramatically, and it helped us get to know our community and neighbours. If you live near a small, independent farm, you can also go and buy directly from them. Sometimes these farms follow organic farming methods, even if they haven’t been officially certified because of the cost and hassle involved. Just ask the farmer.

We have also started growing our own vegetables on our front porch and in our tiny garden, as well as setting up growing patches in our neighbourhood's communal spaces. You'd be amazed by how much you can grow in a small area! In one experiment, a gardener grew \$700 worth of produce—bell peppers, tomatoes, courgette/zucchini, lettuce, and basil—on a garden patch of just one hundred square feet (a little more than 9 m<sup>2</sup>).<sup>499</sup> You can also use vertical planters—hollow tubes with holes in them—to maximise your growing space. We have four of them and grow a variety of berries, vegetables, legumes, leafy greens, and herbs. It's a lot of trial and error in the beginning, but it's also great fun, especially for kids. Our daughter has loved playing with the plants since she was able to crawl. As a side benefit, it lets her grow up in touch with soil, plants, and nature, learn useful life skills, and it enriches her microbiome with plenty of beneficial soil bacteria. There is even research demonstrating that some soil bacteria have a mood-boosting, antidepressant effect by raising your serotonin levels!<sup>500–502</sup> If you have neither a garden nor balcony space to grow vegetables, many towns and cities have community gardens that you can join.

Despite the higher cost, there is an economic argument for choosing organic food. I view it as a long-term investment in our family's health. By choosing organic, you avoid the antibiotics, antibiotic-resistant bacteria, and synthetic pesticides used in conventional farming. You also dramatically raise your intake of dietary antioxidants and Omega-3 fatty acids. Both increase the chance of staying healthy, having healthy children, and avoiding chronic illnesses. In the long run, this will save a lot of money on medication, treatments, therapies, insurance premiums, and missed work. These costs can be debilitating for families. By one estimate, having asthma in the United States

costs on average more than \$4,900 per year, mostly for medication and lost work time.<sup>503</sup> Even if your insurance covers some of it, you're still left with hundreds to thousands of dollars out of pocket. And that's not even counting how valuable health is to your quality of life. So despite the higher prices, I truly believe that organic food is worth it for your health.