

The Organic Manifesto

of a Biologist Mother



by Sandra Steingraber, Ph.D.

**ORGANIC
VALLEY**



Family of Farms

education series

I

FOR nearly two decades, I lived the life of a gypsy biologist—investigating the interactions between organisms and the environments they inhabit in places as varied as Costa Rican rainforests, Sudanese deserts, Mexican tidal pools, and Minnesota pine forests. I slept in tents, dormitories, farm houses, huts with grass roofs, and at least one military bunker. I left for airports at 4 AM. I never balanced my checkbook.

And then I eloped with a sculptor and got pregnant. Now, well into my forties, I am wife to a man with a lot of power tools and mother to a four-year-old daughter and a one-year-old son. Now, I live in a log cabin in rural upstate New York and have seen the same basswood trees bloom four times. Now, I make my living as an environmental writer, analyzing the data of other scientists rather than generating my own. These days, my field research extends about as far as the backyard birdfeeder, which services migrating songbirds heading north to Canadian pine forests or south to Latin American rainforests.

"I'm no longer one of you," I laugh while watching them refuel for their journeys. I teach their calls to my daughter Faith, to whom I have bequeathed my grubby ornithology guide. I whisper their names to my son Elijah, as I nurse him in the old rocking chair that is stationed near the picture window. And when we all sleep upstairs in the big bed together—one child holding on to my hair, the other flung across my chest, I know that I have never lived more symbiotically. A source of food, a place of comfort, a mattress for napping, I myself am now a habitat.

And I balance my checkbook.



Having children after twenty years of a childless adult life has brought with it at least two revelations. One is an acute awareness of the brevity of infancy. You only get a four-month-old for a month. And even at 4 AM when baby-ness seems eternal, it still passes more quickly than you can believe. So Jeff and I compete to be the primary parent. We don't want to miss anything.

The second is the realization that young children—in spite of all kinds of advertising to the contrary—require few possessions. What they do need, in seemingly unquenchable quantities, is the loving attention of their parents. Which brings me to the checkbook. In our household, with its two self-employed adults, money is a means to buy time with Faith and Elijah. The farther I can stretch a dollar, the more hours I have for berry-picking, story-reading, and line dances around the kitchen table.

To this end, Jeff and I recently sought out the advice of a financial counselor. We thought a third pair of eyes looking over our household budget might identify places where we could take up even more slack. And Becky Bilderback—who runs a bed and breakfast, cans her own garden produce, and sews her own curtains—seemed to possess the ideal eyes for the job.

Becky wasted no time scanning down the list of our monthly expenses. But, to both our relief and disappointment, she couldn't find much room for improvement. We own one car, buy clothes at consignment shops, pay off our credit card in full each month. And there wasn't much that could be done about those health insurance premiums. Finally, she tapped her finger on one of our line items. "Here," said Becky. "Right here. This seems high to me." We leaned



over the table. It was our groceries: \$140 per week for food for a family of four. "And another thing," she said. "I don't see a line item for charitable giving." Was this, she wondered, an expense that we had perhaps overlooked?

I took a deep breath. It wasn't. Indeed, the absence of charitable donations and our generous food budget were directly related to each other. Virtually all the groceries Jeff and I buy for our family are organically grown. As well as an investment in a healthy environment for my children, directing my food dollars toward organic farmers is part of my spiritual practice. Simply put, we choose to support an agricultural system that does not rely on toxic chemicals to produce the food we eat. In attempting to articulate the depth of my commitment toward organic food, I realized it was time to write my organic manifesto, complete with all the reasons why I believe the decision to buy organic is rational, ethical, and in the long-run, cost-effective. And here it is.



1

Organic food contains fewer pesticide residues than conventional food.

THIS might seem a self-evident truth. After all, organic farming prohibits the use of synthetic pesticides and intends to offer crops virtually free of residues. And yet the evidence to support this claim has only been available since spring 2002, when a peer-reviewed scientific journal published the first systematic comparison of pesticide residues in organic and non-organic foods.¹ Examining the data from more than 90,000 samples of produce, the authors of this study found that nearly three-quarters of conventionally grown foods had detectable pesticide residues. Three-quarters of organic crops had none. And among the one-quarter of organic samples that did test positive, levels of pesticide contamination were far lower. Conventionally grown foods were also more likely to test positive for multiple pesticides than were their organic counterparts.

2

Children fed organic food have lower residues of certain pesticides in their bodies than children fed conventionally grown food.

ORGANOPHOSPHATE

insecticides kill by attacking the nervous systems of insect pests. They are frequently used in fruit and vegetable farming. A 2003 study measured levels of these chemicals in the urine of pre-school children living in Seattle. Children with conventional diets had, on average, nine times more organophosphate insecticides in their urine than children fed organic produce.² So, are organic foods healthier for our kids? Here is where science yields to mother wisdom. We in the scientific community do not yet know what levels of pesticide exposure are sufficient to endanger the health of human adults, and we know even less about their effects on children. Thus, the wide gray area called “uncertain risk.”

The reasons for our ignorance are many. When researching my book, *Living Downstream*, I discovered that many pesticides on

the market have never been adequately screened for their ability to cause cancer. Even less thoroughly have we tested their ability to affect fetal brain growth, contribute to miscarriages, disrupt hormonal signaling, alter the onset of puberty, or undermine fertility. Evidence from animal studies suggests we have reason to be concerned about these possibilities and investigate them further.

I also learned that most human dietary studies of pesticide exposure presume adult eating habits. And yet, as any mother will testify, children dine on fewer foods in proportionally higher quantities than their parents do. (I do not routinely consume two bananas and two avocados a day. My 27-pound son does.) Finally, consider that young children lack many of the biological defenses that protect adults against the toxic effects of pesticides. All of us grown-ups, for example, possess a blood-brain barrier. It works quite well to keep neurological poisons from entering the gray matter of our brains. However, we did not acquire this cerebral suit of armor until we reached the age of six months. Infants are thus far more susceptible to the brain-addling potential of insecticides and at much lower doses.

Pesticides, by design, are poisons. The science shows us that most organic produce is free from pesticide residues and most conventionally grown produce is not. The science shows that children fed organic produce have significantly lower pesticide residues in their bodies than children fed conventional produce. Whatever we do or don't know about threshold levels for harm, my intuition tells me that food with no poison is better for my children's developing minds and bodies than food with some.



3

Organic agriculture is part of good prenatal care.

WOMEN'S bodies are the first environment. So says native American midwife, Katsi Cook. This simple truth became the starting point of my book *Having Faith*, which explores the intimate ecology of pregnancy. It was a project that I began during the first month of my pregnancy with the real-life Faith and finally finished a week before I gave birth to her younger brother. Those four years of research and writing can really be summed up in two simple sentences: If the world's environment is contaminated, so too is the ecosystem of a mother's body. If a mother's body is contaminated, so too is the child who inhabits it.

The placenta, which does such an admirable job at keeping bacteria and viruses out of the womb's watery habitat, is ill-equipped to serve as a barrier to toxic chemicals. Pesticides that are made up of smaller molecules are afforded free passage. They slip easily from the mother's bloodstream into the blood of the baby's umbilical cord. Pesticides made of bigger, heavier molecules are partly broken down by the placenta's enzymes before they pass through. But, ironically, this transformation sometimes renders them even *more* toxic.³

We have much to learn about the reproductive effects of pesticides in use today. In the meantime, organic farming—like sobriety, seatbelts, and not smoking—makes good prenatal sense.

4

Organic agriculture protects air and water.

LAST year, I received a phone call from a reporter at my hometown newspaper. He asked me to comment on the news that herbicide drift had now made it all but impossible to grow grapes commercially in central Illinois.⁴ In other words, in the place where I grew up, the wind itself now contains so much weed killer (2,4-D) that grape leaves curl up and die. Illinois's cherry trees are perishing for the same reason. Looking out at my son stacking blocks on our back deck, a spring breeze ruffling the blond feathers of his hair, I wondered what effect this pesticide-laden air was having on the children who were breathing it.

After I hung up, I thought about my pregnancy with my daughter Faith, the first five months of which were spent in downstate Illinois. While researching the drinking water data for



the town in which I was living, I discovered that two herbicides—alachlor and atrazine—were routinely found in the tap water there. Neither had ever exceeded its legal maximum contaminant level. However, I was not entirely reassured. These limits were never set with human embryos and fetuses in mind.

Pesticides do not adhere to the fields in which there are sprayed. They evaporate and rise into the jetstream. They drift for miles in the wind. They fall in the rain. They are detectable in fog. They insinuate themselves into the crystalline structures of snowflakes. They follow storm run-off into gullies and streambeds. They descend through soil into groundwater.

Organic agriculture does not poison wells and reservoirs. It does not bring ruin to vineyards and orchards. It is respectful of snow, fog, wind, and rain—our life support system.



5

Organic agriculture protects wildlife.

MY most beloved landscape, the Illinois River valley near Peoria, is an ecologically diminished place. Poisoned by insecticide run-off, the river's fingernail clams disappeared in 1955. The diving ducks that depended on the clams for their food source soon followed. Ring-necks. Canvasbacks. Scaups. They are all gone now. Then, poisoned by herbicide run-off, the river's lush vegetation vanished from the shallows. Wild celery. Coontail. Sago. The seeds of these aquatic plants fed the river's dabbling ducks. And so they vanished too—the wigeons and the gadwells. By the time I was born in 1959, the riverbank near my home had

become an eerily silent place. I learned to identify native Illinois ducks not by direct observation but by studying stuffed specimens in ornithology labs. I learned their calls by listening to instructional tapes. I felt myself a natural historian of ghosts.

New studies identify pesticides as a leading suspect in the ongoing decline of North America's frog populations. For example, trace exposures to certain common weed killers emasculate male tadpoles. They do so by stimulating an enzyme that converts male hormone into female hormone. Thus altered, male tadpoles metamorphose into hermaphroditic adults.⁵ Similarly, nitrates from synthetic fertilizers can trigger deformities in developing tadpoles or kill them outright—at levels well below their legal limits in drinking water.⁶

Faith and I are sometimes kept awake April nights by the shrill EEP! EEP! of the spring peepers who inhabit the wetlands out behind our cabin. Peepers are a cricket-sized species of tree frog with a piercingly loud method of finding suitable mates. The peepers' cries, which signal the advent of spring more reliably than any bird song, are soon joined by the quieter ZZZIPPP... ZZZIPPP of the chorus frog, whose call most closely resembles a finger drawn over the tines of a comb. Later in the season comes the loudspeaker JUG-O-RUM of the bullfrog, whose booming pronouncements make Elijah jump and laugh out loud. I want the songs of frogs to remain as familiar to my children as the lullabies we sing together. I want my grocery-buying habits to help sustain the annual spring amphibian festival in our backyard. Let frogs keep us up all night. No more animal ghosts.



6

Organic agriculture promotes public health.

FARMERS have higher rates of certain cancers than the general population. So do farmers' children.⁷ An emerging body of evidence suggests that exposure to pesticides on farms may be part of the reason.

Other studies have revealed possible links between agricultural use of pesticides and birth defects. For example, according to a recent California study, living near agricultural fields where pesticides are sprayed raises the risk of stillbirths due to birth defects. Researchers found the largest risk among babies whose mothers lived within one mile of such areas during their first trimester of pregnancy. Similarly, a Minnesota study found that the children of farmers, as well as those born to families living in agricultural areas, have elevated rates of birth defects. Similar findings come from Iowa.⁸

All dread, grief, and human suffering aside, cancer and birth defects are expensive. And here lies the economic sense of organic agriculture.

Food that is grown organically often does cost more than

conventionally grown foods. There are at least three reasons for this higher price tag. Organic foods are more strictly regulated. Organic farming practices require more labor. And organic farms tend to be smaller. However, conventionally grown foods carry with them many indirect costs. The price of cleaning up contaminated water, the loss of wildlife, and the increased health care needs of farm families are just a few. These costs may not be incorporated in the price we pay in the grocery store, but they are reflected in our tax bills and insurance premiums.

As the demand for organic food rises, prices at the cash register will fall. In the meantime, here is how I make organic food more affordable for my family: instead of donating to the American Cancer Society or the March of Dimes, I fold my charitable giving into my grocery bill. By buying organic, I feed my own family and, at the same time, work toward the prevention of cancer and birth defects in rural America.





7

Organic farms promote community.

RISING just west of our cabin is Snyder Hill, a long, steep rocky ridge that blocks the afternoon sun far sooner than I'd like during the too-short days of the too-long winters here. On top of that hill is a flat, wide expanse of good drainage and good views that is also the location of an organic vegetable farm. We are grateful to this farm, as the snow and rain that falls on its fields eventually descend the slopes of Snyder Hill and seep into the hollow where we live, recharging our drinking water well and filling up our froggy swamp. Our home shares a watershed with this agricultural operation.

In addition to this ecological link, we are also joined economically. Organized on the principle of community supported agriculture (CSA), the farm atop our hill sells its produce directly to consumer-members who purchase a share of the season's harvest in early spring. As shareholders, Jeff and I help pay for seeds, machinery, and labor, thereby guaranteeing the farmers' production expenses. This investment is returned throughout the months that follow, in the form of a parade of fresh produce. Our farm, as Faith calls it, also provides us flowers, berries, honey, herbs, and eggs.

Once a week we gather in the barn to collect our share. Some of the crops are picked and packed for us. Some lie out in the fields for us to harvest ourselves.

Along with the food has come other intangible benefits. My four-year-old knows how to pick green beans. She knows about how many potatoes make a pound. My one-year-old can recognize a tomato vine at twenty paces. They both know the joy of fresh raw sugar peas. And I see them coming to understand the relationship between those who eat food and those who grow it, between the dinner on the table and the land from which the dinner comes. When a summer cloudburst cut short a family expedition last July, my daughter said cheerily, "Our carrots are drinking now."

And our farm provides us a sense of community. Among its hundred or so members, recipes are exchanged along with child care. Last summer, some fathers got together and constructed a children's play area out by the bean fields. Monthly potluck dinners are organized, with offerings so dependably delicious that I insisted on attending one of them when Elijah was only three days old. A year later, at another late-summer farm feast, I found myself dancing with my sweetheart while a bluegrass band played in the barnyard and a yellow moon rose over the fields. Around us, a stream of sticky-mouthed children, including two of our own, ran and scattered in the tall grass.

I thought back to that household budget of ours. "And another thing," I imagined telling our financial advisor, "organic agriculture saves us a bundle on entertainment."





Sources

1. B.P. Baker et al., "Pesticide Residues in Conventional, Integrated Pest Management (IPM)-grown and Organic Foods: Insights from Three US Data Sets," *Food Additives and Contaminants* 19(2002): 427-446.
2. C.L. Curl et al., "Organophosphorus Pesticide Exposures of Urban and Suburban Pre-school Children with Organic and Conventional Diets," *Environmental Health Perspectives* 111(2003): 377-82.
3. R.G. Gupta, "Environmental Agents and Placental Toxicity: Anticholinesterases and Other Insecticides," in B.V. Rama Sastry, ed., *Placental Toxicology* (Boca Raton: CRC Press, 1995), pp. 257-78.
4. S. Tarter, "Grapes Struggle in Illinois Due to Chemical Drift, Overspray," *Peoria Journal Star*, April 30, 2002.
5. T. Hayes et al., "Herbicides: Feminization of Male Frogs in the Wild," *Nature* 419(2002): 895-96.
6. A. Marco et al., "Sensitivity to Nitrate and Nitrite in Pond-Breeding Amphibians from the Pacific Northwest, USA," *Environmental Toxicology and Chemistry* 18(1999): 2836-39.
7. Cancers found in excess among U.S. farmers include blood and nervous system cancers. Cancers found in excess among their children include brain cancers, leukemias, Wilms' tumor, Ewing's sarcoma, and germ cell tumors. L.E. Fleming et al., "National Health Interview Survey Mortality Among US Farmers and Pesticide Applicators," *American Journal of Industrial Medicine* 43 (2003): 227-33; L.M. O'Leary et al., "Parental Occupational Exposures and Risk of Childhood Cancer: A Review," *American Journal of Industrial Medicine* 20 (1991): 17-35; J.L. Daniels et al., "Pesticides and Childhood Cancers," *Environmental Health Perspectives* 105(1997): 1068-77.
8. E.M. Bell et al., "A Case-Control Study of Pesticides and Fetal Death Due to Congenital Anomalies," *Epidemiology* 12(2001): 148-156; V.F. Garry et al., "Pesticide Appliers, Biocides, and Birth Defects in Rural Minnesota," *Environmental Health Perspectives* 104(1996): 394-99; R. Munger et al., "Birth Defects and Pesticide-Contaminated Water Supplies in Iowa," *American Journal of Epidemiology* 136(1992): 959. Birth defects associated with pesticide exposure include cleft lip and palate, limb defects, heart malformations, spina bifida, hydrocephaly, undescended testicles, and hypospadias. See also G. Solomon et al., *Pesticides and Human Health: A Resource for Health Care Professionals* (San Francisco: Physicians for Social Responsibility, 2000), pp. 40-42.

On-line Resources

Birth Defect Research for Children, Inc.

Learn more about the National Birth Defects Registry, a research program that studies associations between birth defects and environmental contaminants.

www.birthdefects.org

Beyond Pesticides

Learn more about alternatives to pesticides in homes, gardens, and schools.

www.beyondpesticides.org

Northwest Coalition for Alternatives to Pesticides

Learn more about the hazards of pesticides and their alternatives.

www.pesticide.org

Organic Trade Association

Learn more about the economics of organic and conventional agriculture.

www.ota.com

Organic Valley Website

Learn more about the farmers and organic products of the Organic Valley cooperative.

www.organicvalley.com

Pesticide Action Network

Learn more about worldwide efforts to advance alternatives to pesticides.

www.panna.org

Robin Van En Center for CSA Resources

Learn more about community supported agriculture and locate a CSA in your area.

www.csacenter.org



*Sandra Steingraber, Ph.D., lives with her husband and children in Ithaca, New York. Biologist, author, and cancer survivor, she is the 2004 recipient of the Rachel Carson Leadership Award from Carson's alma mater, Chatham College. Her two books, *Living Downstream: An Ecologist Looks at Cancer and the Environment* and *Having Faith: An Ecologist's Journey to Motherhood*, from which portions of this essay are adapted, have received numerous awards for science writing. Her research on children's environmental health was recently featured on the PBS show, "Now," with Bill Moyers*

Organic Valley Family of Farms™ is a cooperative owned by hundreds of organic farm families joined across America. We are earth-stewards honoring the interdependency of all of living things. Using nature as our teacher, we are proud to provide your family with farm-fresh dairy, juice, eggs and produce without the use of pesticides, hormones or antibiotics.

*Photographs by
Carrie Branovan © 2003*

Printed on paper made from 50% recycled fiber, with vegetable-oil-based inks.

