



# School Pesticide Monitor

A Bi-Monthly Bulletin on Pesticides and Alternatives  
Beyond Pesticides, 701 E Street SE, Suite 200, Washington, DC 20003  
info@beyondpesticides.org ■ www.beyondpesticides.org

Vol. 15 No. 6, 2015

## Another Study Shows that Organic Diet Lowers Pesticide Levels in Children

New research from the Center for Environmental Research and Children's Health (CERCH) shows that children, especially those in low-income and agricultural families, who switched to an organic diet reduced their bodies' level of pesticides. This California study is one of several that documents the benefits of eating an organic diet, especially for children who are especially vulnerable to pesticide exposures due to the developing bodies.

The study, *Effect of Organic Diet Intervention on Pesticide Exposures in*

*Young Children Living in Low-Income Urban and Agricultural Communities* follows 40 children, 3-6 years old from low-income families living in urban and agricultural environments in Oakland and Salinas, California. The children alternated between a conventionally grown diet and organic, and urine samples were analyzed each day.

Researchers measured 23 metabolites of several pesticides classes, including organophosphates (OP) and pyrethroid insecticides, and the herbicides 2,4-D and metolachlor. These pesticides are frequently detected (>

72%) in urine samples collected, with metabolites of 2,4-D detected 90 percent of the time, and pyrethroids 82 percent.

Overall, among the most frequently detected pesticides, metabolites of OPs decreases by nearly 50 percent when children are on an organic diet, and levels of 2,4-D falls by 25 percent. Pyrethroid metabolites however, did not significantly decrease during an organic diet. The researchers hypothesize that this is due to the overwhelming use of pyrethroids in and  
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## Agricultural Crop Density Linked to Childhood Cancer in Midwest

In addition to dietary exposure to pesticides through residues on food, pesticide use in chemically-intensive, conventional agriculture can have devastating impact on those who live in surrounding areas. According to a new study, living in crop-dense regions is linked to increased leukemia and central nervous system cancers in children.

Although there is a litany of scientific literature that highlights the link between pesticide exposure and childhood illness, this study is one of few that examines the relationship between residential exposures to agricultural pesticides via crop density and adverse health outcomes, and may serve as a basis for further investigation into childhood

cancer rates in areas where agricultural pesticides are highly used.

The study, titled *Agricultural crop density and the risk of childhood cancer in the Midwestern United States: an ecologic study*, was published in the journal *Environmental Health*. Using crop density as a surrogate for residential exposure to agricultural pesticides, the study linked county-level agricultural census data and cancer incidence data for children between the ages 0 to 4 in six Midwestern states and found evidence of an association between childhood cancer incidence and the production of crops such as dry beans, oats, and sugar beets.

Researchers found statistically sig-

nificant exposure-response relationships for dry beans and total leukemias and acute lymphoid leukemias, oats and acute myeloid leukemias, and sugar beets and total leukemias. State-level analyses discovered additional positive associations for total leukemia and central nervous system (CNS) tumors. While researchers were not able to examine specific pesticides used in these regions, they cited atrazine, glyphosate, 2,4-D, and MCPA as some of the most highly-used chemicals during the study period.

The link between adverse health outcomes in children and pesticide exposure is well-documented. In the last newsletter, we reported that a  
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## Organic Diet

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around homes, and children are exposed to pyrethroids from their living environment, not solely through diet. Pyrethroids are also more frequently detected in children from the urban area, which also reports higher use of pesticides in the home. Conversely, the most frequently detected metabolites are generally higher in children from the agricultural region compared to those from the urban area, suggesting higher exposure levels for children living in agricultural communities.

Nina Holland, PhD, an adjunct professor in the University of California, Berkeley, School of Public Health who worked on the study, said this was “one of the most remarkable studies of its kind” and could encourage farmers to grow organically.

This study is not the first of its kind. Earlier this year, Canadian scientists reported a similar conclusion for people who ate a conventional diet. In that study, the scientists studied nearly 4,500 people from six U.S. cities and examined long-term dietary exposure to 14 OPs, and found lower pesticide levels in those who ate organic.

In 2012, the American Academy of

Pediatrics (AAP) weighed in on the organic food debate recognizing that lower pesticide residues in organic foods may be significant for children. The Academy also noted that choosing organic is based on larger environmental issues, as well as human health impacts like pollution and global climate change.

Studies have also found additional health benefits to eating organic. A ten-year University of California study, which compared organic tomatoes with chemically grown produce, found that they have almost double the quantity of disease-fighting antioxidants called flavonoids. A comprehensive review of 97 published studies comparing the nutritional quality of organic and conventional foods shows that organic plant-based foods (fruits, vegetables, grains) contain higher levels of eight of 11 nutrients studied, including significantly greater concentrations of the health-promoting polyphenols and antioxidants. A study by Newcastle University, published in the *Journal of Science of Food and Agriculture*, found that organic farmers who let their cows graze as nature intended are producing better quality milk.

Many people have been making the switch to organic for various health-based reasons. According to a 2014

Gallup poll, nearly half of all U.S. adults “actively” seek to add organic food to their diets. Many who eat and incorporate organic foods into their diet are from city areas, whereas those who eat the least organic foods are described as coming from rural areas.

A similar 2014 poll by the Organic Trade Association (OTA) reports that consumption of organic products has continued to increase at a monumental pace. According to the survey, sales of organic products in the U.S. jumped to \$35.1 billion in 2013, up 11.5% from the previous year’s \$31.5 billion and the fastest growth rate in five years.

Beyond Pesticides advocates in its program and through its *Eating with a Conscience* website ([www.eating-withaconscience.org](http://www.eating-withaconscience.org)) choosing organic because of the environmental and health benefits to consumers, workers, and rural families. The *Eating with a Conscience* database, based on legal tolerances (or allowable residues on food commodities), describes a food production system that enables toxic pesticide use both domestically and internationally, and provides a look at the toxic chemicals allowed in the production of the food we eat and the environmental and public health effects resulting from their use.

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## Midwest

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recent Harvard study found that residential exposure to indoor insecticides in and around a child’s home is linked to increased risk of childhood leukemia and lymphoma. And, an investigation by Yale University researchers found that prenatal exposure to the widely used agricultural pesticide chlorpyrifos is linked to tremors in childhood. An article published in the Endocrine Society’s journal *Endocrinol-*

*ogy* found that parental exposure to environmental stressors, such as pesticides, before a child is conceived can alter the way genes are expressed in the mother and father, ultimately harming the child’s health when those genes are passed down to the next generation.

The conventional approach to pest management makes pesticide drift an inherent risk to those in the surrounding community as well as the wider environment. Supporting organic agri-

culture is one of the best ways you can eliminate hazardous pesticide drift and support the health of those that grow our food, and live in crop-dense areas. For this reason and more, Beyond Pesticides advocates eating organic because of the environmental and health benefits to consumers, workers, and rural families.

To learn about the benefits of organic agriculture, see Beyond Pesticides’ Organic Food program page (<http://bit.ly/BPOrganicAgriculture>).