Reducing Pesticide Exposure in your Food & Water

Center for Land Use Education

www.uwsp.edu/cnr/landcenter

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**You are what you eat**

By making strategic food choices you can dramatically reduce pesticide exposure starting with your very next meal.

**CHALLENGE**

70% of food samples tested by the U.S. Department of Agriculture contained pesticides.¹

**SOLUTIONS**

1) Choose fruits and vegetables grown in the U.S. They have lower health risks from pesticides than imported foods.²

2) Grow your own food without pesticides.

3) Choose foods grown without pesticides, especially for those with high pesticide risks. You can ask farmers about their growing practices or choose foods labeled organic, which means they were grown without synthetic pesticides. Organic foods usually cost less when you buy at farm stands, farmers markets or from Community Supported Agriculture farms (CSAs). You can find farms in your area that don’t use pesticides at [http://farmfreshatlas.org/](http://farmfreshatlas.org/)

4) Find out what pesticides are found on foods you commonly eat at [www.whatsonmyfood.org](http://www.whatsonmyfood.org)

### U.S. grown produce with the GREATEST pesticide risk per serving

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cranberries</td>
<td>1) Green beans</td>
</tr>
<tr>
<td>2) Nectarines</td>
<td>2) Bell peppers</td>
</tr>
<tr>
<td>3) Peaches</td>
<td>3) Celery</td>
</tr>
<tr>
<td>4) Strawberries</td>
<td>4) Cucumbers</td>
</tr>
<tr>
<td>5) Pears</td>
<td>5) Potatoes</td>
</tr>
<tr>
<td>6) Apples</td>
<td>6) Tomatoes</td>
</tr>
<tr>
<td>7) Cherries</td>
<td>7) Peas</td>
</tr>
<tr>
<td>8) Cantaloupe</td>
<td>8) Lettuce</td>
</tr>
</tbody>
</table>


### U.S. grown produce with the LOWEST pesticide risk per serving

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Sweet corn</td>
<td></td>
</tr>
<tr>
<td>2) Onions</td>
<td></td>
</tr>
<tr>
<td>3) Cauliflower</td>
<td></td>
</tr>
<tr>
<td>4) Sweet peas, frozen</td>
<td></td>
</tr>
<tr>
<td>5) Prunes</td>
<td></td>
</tr>
<tr>
<td>6) Asparagus</td>
<td></td>
</tr>
<tr>
<td>7) Pineapples</td>
<td></td>
</tr>
<tr>
<td>8) Tomato paste</td>
<td></td>
</tr>
<tr>
<td>9) Peaches, canned</td>
<td></td>
</tr>
<tr>
<td>10) Apple juice</td>
<td></td>
</tr>
<tr>
<td>11) Grape juice</td>
<td></td>
</tr>
<tr>
<td>12) Winter squash</td>
<td></td>
</tr>
</tbody>
</table>

**Pesticides** include herbicides, insecticides and fungicides

**Organic food** is grown without synthetic pesticides

Babies and children are more vulnerable to pesticides than adults because they eat and drink more per pound of body weight and are less able to detoxify pesticides when they are exposed.³

Research has found:
- Children with higher levels of organophosphate (OP) pesticides in their urine were more likely to be diagnosed with ADHD.⁴
- Children whose mothers had higher levels of OP pesticides in their urine when pregnant had lower IQ scores at ages 2-3 and ages 6-9.⁵
- When compared with children not exposed to pesticides, children living in a valley in Mexico with frequent use of agricultural pesticides had 1) reduced eye-hand coordination, 2) reduced 30-minute memory, and 3) reduced ability to draw a person.⁶ See drawings by 4 and 5-year olds at right.

OP pesticides are insecticides. Based on the most recent data, over 50,000 pounds of OP pesticides are applied annually in Wisconsin to apples, green beans, tart cherries, and soybeans.⁷

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**CHALLENGE**

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**SOLUTIONS**

1) **When children switched to eating organic fruits, vegetables, juices and grains the level of OP pesticides in their urine fell to non-detectable levels within a few days.**

   Graph at right shows exposure to a malathion (OP) metabolite. Eating organic food provides a dramatic and immediate protective effect against exposures to pesticides commonly used in agriculture.⁸

2) **Avoid pesticide use in your home and yard.⁹**

   Weed and feed lawn products contain pesticides.

3) **Avoid pesticide use at work as much as possible.**

4) **Stay away from areas sprayed with pesticides.** Pesticides can drift for miles, depending on dust and wind conditions.¹⁰
Atrazine is a common corn herbicide that has been used for decades in WI. 1.7 million pounds of atrazine were applied to 2.4 million acres of corn in WI in 2010. Atrazine is detected in at least 25% of private wells in WI (blue and red dots on map). Health effects include:

- Cardiovascular damage & reproductive difficulties in some people who drink water with atrazine over the drinking water standard for many years.
- Elevated concentrations of agrichemicals in surface water in April–July coincided with higher risk of birth defects in live births with the last menstrual period April–July.
- Women exposed to atrazine in their drinking water below the safety standard were associated with more menstrual cycle length irregularity, more instances of greater than 6 weeks between periods, and decreased reproductive hormone levels which may reduce fertility.
- Atrazine desmasculinizes male testicles producing testicular lesions associated with reduced sperm numbers in fish, amphibians, reptiles and mammals and induces partial or complete feminization in fish, amphibians, and reptiles.

The solutions are the same as those to the previous challenge.
We estimate that 1/3 of private wells in WI contain agricultural pesticides. Wisconsin farmers apply over 13 million pounds of pesticides per year, more than 2 pounds per person. Some of these pesticides seep down into drinking water. Wells in areas with more cropland were more likely to contain pesticides. In WI, the crops treated with the most pesticides per acre are apples with 28 pounds of pesticides per acre per year and potatoes with 13 pounds per acre per year.

SOLUTIONS

1) Purchase food from farms in your area that use few or no pesticides. Fortunately, Wisconsin has a strong and growing network of farmers who use few or no pesticides with over 1,100 organic farms from which to choose. If pesticides aren’t applied to the land, they won’t harm farmworkers, be in our food, or get in the drinking water. You can learn about farms in your area at www.savorwisconsin.com and www.farmfreshatlas.org

2) Grow some of your own food without pesticides.

3) If you drink water from a private well, have it tested once each year for bacteria and nitrate which comes from fertilizer, manure and septic systems. If nitrate levels are over 5 ppm, it’s more likely pesticides are also present. For information about the UW-Stevens Point drinking water lab, see www.uwsp.edu/cnr/weal/

4) Learn more about groundwater quality in your county at the “Protecting Wisconsin’s Groundwater” website http://wi.water.usgs.gov/gwcomp/find/

5) If you have pesticides in your well, install a drinking water filter that is certified by the National Sanitation Foundation to remove the specific pesticide(s) present.
Pesticides in the environment negatively affect wildlife as well as humans. Each year, approximately 672 million birds are directly exposed to pesticides on farmlands in the United States, and of these, about 10 percent, or 67 million birds, are estimated to die immediately as a result.21

In addition, numerous pesticides have been found to cause specific health effects at environmental levels including:

- Male frogs exposed as tadpoles to very low levels of atrazine, a common corn pesticide, develop both male and female sex organs.22
- Fish exposed to environmentally-relevant concentrations of atrazine had significantly reduced reproduction.23
- Chlorothalonil, the most widely used fungicide in the U.S., killed nearly every amphibian at concentrations similar to those measured in the environment.24 In Wisconsin, 475,000 pounds of chlorothalonil were used on potatoes in 2010.25

The same solutions that reduce people’s pesticide exposure will reduce exposure for pets and wildlife too.

Educational articles about how pesticides affect health

- Do pesticides affect learning and behavior? by Warren Porter
  [www.beyondpesticides.org/lawn/activist/PorterLearningBehavior.pdf](http://www.beyondpesticides.org/lawn/activist/PorterLearningBehavior.pdf)
- Female mice disabled by parents’ pesticide intake (discusses human health effects too) by Lynn Markham [http://bayviewcompass.com/archives/6398](http://bayviewcompass.com/archives/6398)

ACKNOWLEDGEMENTS

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References:

1 Pesticides found by USDA on food from grocery stores, based on 12,000 samples collected and analyzed by the U.S. Department of Agriculture’s Pesticide Data Program in 2008 whatsonmyfood.org


4 Bouchard et al. 2010. Attention-Deficit/Hyperactivity Disorder and Urinary Metabolites of Organophosphate Pesticides, Pediatrics (study of 1139 children representative of U.S. population) www.pediatricsdigest.mobi/content/125/6/e1270.full Marks et al. 2010. Organophosphate Pesticide Exposure and Attention in Young Mexican-American Children: The CHAMACOS Study, Environmental Health Perspectives (Rural agricultural children; Salinas Valley, CA); Rauh et al. 2006. Impact of Prenatal Chlorpyrifos Exposure on Neurodevelopment in the First 3 Years of Life Among Inner-City Children, Pediatrics (Inner city children: NYC, where chlorpyrifos use for roach control has high until 2001)


11 Basic Information about Atrazine in Drinking Water. U.S. Environmental Protection Agency http://water.epa.gov/drink/contaminants/basicinformation/atazine.cfm


17 Same as endnote 7.


