

Abstract

Organophosphate pesticides continue to be widely used by the agricultural industry in the United States. The Centers for Disease Control tracks exposure to these chemicals or their metabolites through the National Biomonitoring Program. A review of the pesticide residue data gathered by the USDA Pesticide Data Program was conducted during this study to determine which foods frequently contain residues of organophosphates or their metabolites. Between 2004 and 2008, fruit, vegetable, nuts and grains were routinely collected and analyzed for a variety of pesticide residues. Per capita availability data was also obtained from the USDA to determine how much Americans consume of each commodity. The results of this review indicate that wheat and corn are the commodities most likely contributing to organophosphate exposure in children. Percentage of wheat samples with detectable concentrations of chlorpyrifos were reported as 20.8, 23.1, and 16.7 during 2004, 2005, and 2006, respectively. Similarly, percentage of wheat samples with detectable concentrations of malathion were reported as 49.4, 66.9, and 63.0 during 2004, 2005, and 2006, respectively. Estimated per capita wheat consumption was and still is presumably approximately 95 pounds per year. Percentage of corn samples with detectable concentrations of chlorpyrifos were reported as 30.0 and 17.8 during 2007 and 2008, respectively. Percentage of corn samples with detectable concentrations of malathion were reported as 37.9 and 33.7 during 2007 and 2008, respectively. Estimated per capita corn consumption decreased from 52 to 49 pounds from 2007 to 2008. Corn is widely used for the production of sweeteners such as high fructose corn syrup. Children are at risk of exposure to multiple pesticide residues from consuming the very same commodity and cumulative exposures are likely to occur.

References:

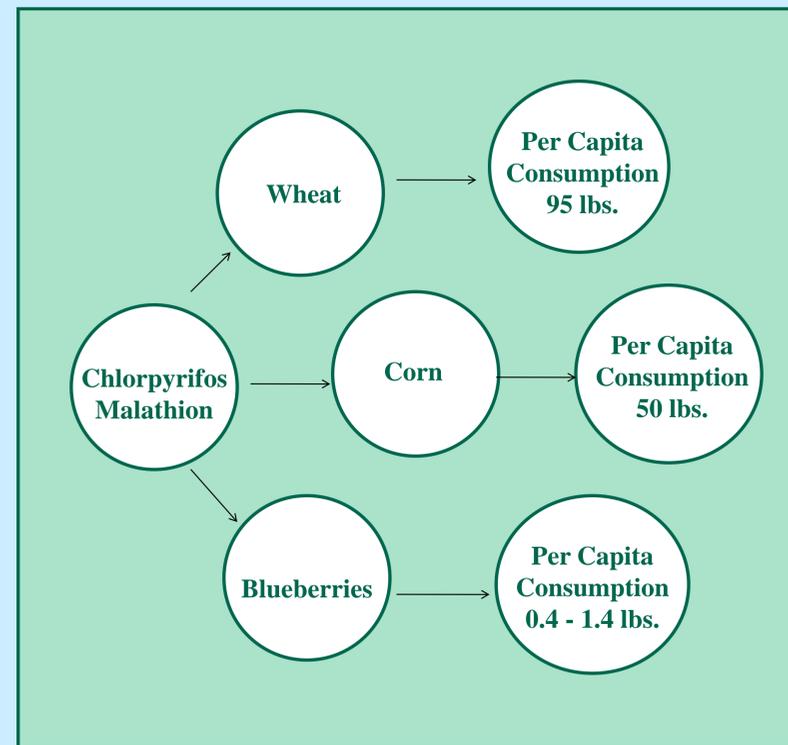
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Action

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Organophosphate (OP) Pesticides

- OP pesticides are neurotoxic – chronic low level exposures contribute to Attention-Deficit Hyperactivity Disorder prevalence.
- Chlorpyrifos is the most extensively studied OP and may be a contributing factor in the development of Autism.
- According to the Agency for Toxic Substances and Disease Registry, Chlorpyrifos may interact with Pb or Hg to produce harmful additive effects.



Organophosphate (OP) Exposure

- OP residue in corn sweeteners unknown (e.g. high fructose corn syrup)
- OP residue in wheat products (e.g. bread, cereal) detected at low levels.
- Children are high end consumers of cereal, bread, and corn sweeteners.
- Children are at risk of multiple daily exposures to OP.
- Exposure to OP has been linked to the development of autism and ADHD.

“A mind is a terrible thing to waste.” United Negro College Fund (1972)

Pesticide Use in the U.S.

- According to the U.S. Geological Survey, about 1 billion pounds of conventional pesticides are used each year.
- Approximately 10-21 million pounds of Chlorpyrifos is used annually by farmers on a variety of crops (except on tomato and pre-blooming apple) .
- Corn is the largest agricultural market for Chlorpyrifos.
- Chlorpyrifos is frequently found in streams due to its intensive use in agriculture. United Nations Universal Declaration of Human Rights -1948

Organophosphate exposures in children occur primarily through food consumption.

- Centers for Disease Control researchers found that children 6-11 years of age have significantly higher OP exposures compared to adults and teenagers.

We reviewed the OP pesticide residue data for all crops sampled and analyzed by the U. S. Pesticide Data Program (PDP) from 2004-2008 and compared our findings to the USDA Food Availability Per-capita Consumption Data.

- The PDP samples different crops each year.
- Corn samples were collected/analyzed from 2007-2008 but not in 2004 or 2005.
- Wheat samples were collected/analyzed from 2004-2006 but not in 2007 or 2008.
- The two OP residues most frequently detected were Chlorpyrifos and Malathion.
- Multiple OP residues were detected each crop.
- Hundreds of samples were collected and analyzed.

OP Residue Data for Corn

Year	% of Samples w/Chlorpyrifos Methyl	% of Samples with Malathion	Annual Consumption Per Person (lbs.)
2007	30.0	37.9	51.9*
2008	17.8	33.7	49.3*

*refers to annual per capita consumption total corn sweeteners (high fructose corn syrup, corn syrup, dextrose, etc...). The primary use of corn is for the production of corn sweeteners.

OP Residue Data for Wheat

Year	% of Samples w/Chlorpyrifos Methyl	% of Samples w/Malathion	Annual Consumption Per Person (lbs.)
2004	20.8	49.4	94.8
2005	23.1	66.9	94.6
2006	16.7	63.0	95.6

Conclusion

More research needs to be conducted to determine the organophosphate residue content found in food products made from grain. Exposure to multiple organophosphate pesticides has been linked to the development of learning disabilities in children.