

Fish School: Taking Stock of Risks and Benefits

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University of Illinois and Purdue University Calumet**

**Reaching At-Risk Audiences and Today's Other Food Safety Challenges
September 29, 2006**

“Fish School”

- **Funded by U.S. EPA-GLNPO**
- **USEPA and FDA consumer advisory**
- **At risks populations**
- **Education project for teachers/students grades 6-12**

Fish is Good to Eat!

- Easy to prepare
- Economical to catch locally
- Culturally important to many populations



Benefits of Eating Fish

- Fish are part of a healthy, well-balanced diet.
- Fish are low in saturated fat.
- Fish are a great source of vitamins, minerals and protein.



Concerns about Eating Fish



- Fish can contain harmful chemicals.
- These contaminants can cause long-lasting health problems.
- Contaminated fish don't look, smell, or taste different, but can still be harmful.
- Be especially careful if your are pregnant, nursing a baby, or have a young child.

What Can You Learn from Fish Advisories?

- Which fish are unsafe to eat
- Which fish you should eat less of
- Which fish to eat more often
- Visit U.S. EPA fish advisories Web site www.epa.gov/ostwater/fish



How to Prepare and Cook Fish Wisely

- **Remove parts that are higher in fat.**
- **Bake or broil the fish to allow fat to drain.**
- **After cooking, discard all liquids.**



Publications

- **Contaminants in Fish and Seafood--A Guide to Safe Consumption.**

(Illinois & Indiana versions).

- ✓ **English**
- ✓ **Polish**
- ✓ **Spanish**
- ✓ **Chinese**

- **In brochure and flip chart form.**



Other Publications

- The lowdown on mercury.
- What you need to know before you eat that fish!
- The lowdown on PCBs.
- What you need to know before you eat that fish! (PCBs and Your Family)

What You Need to Know Before You Eat That Fish! PCBs and Your Family

Why eat fish?

- Important sources of protein
- Important sources of omega-3 fatty acids

What are PCBs?

- Polychlorinated biphenyls (PCBs)
- Manmade chemicals
- Used by industry because they are chemically stable and non-flammable.
- No longer manufactured or marketed in the U.S.
- Found globally, in the lower atmosphere, in the oceans, sediments, fish, and wildlife.

How do PCBs get into fish diets?

- They can be released into the environment that eventually...
- They...

Where can you get more information?

Environmental Protection Agency
www.epa.gov/out/fish/

Food and Drug Administration
www.cfsan.fda.gov/~dms/advnchg.html

Department of Natural Resources
state.il.us/dnr/index.htm

Department of Public Health
cph.state.il.us/envhealth/fact-sheet.htm

Environmental Protection Agency
www.epa.state.il.us

Illinois Grant College
www.iugcp.org

Illinois Department of Public Health
www.idph.state.il.us

found in the resources in booklet cases are sold.

The Lowdown on Mercury

You know that eating fish is an important part of your diet. You may have also heard that eating fish can be risky. So, what is the real story? Fish are a healthy, low-fat source of protein. However, some fish can contain harmful levels of contaminants. If you are pregnant, planning on being pregnant, nursing or have young children then you should be concerned.

Looking at a fish, or tasting or smelling a fish will not tell you if a fish is contaminated. This publication discusses mercury and the possible health effects associated with eating mercury contaminated fish.

What is mercury?

Mercury is a toxic metal that occurs in the environment naturally and through human activity. For example, it can be emitted from coal-fired power plants or when mercury-laden garbage is incinerated. Once in the air, mercury eventually falls to the ground with rain and snow, landing on soil or in bodies of water. Lakes and rivers are also contaminated when there is a direct discharge of mercury-laden industrial or municipal waste into these water bodies.

In the environment, this toxin can be converted by microorganisms into methylmercury, one of the most poisonous forms of mercury. Fish that live and feed in contaminated waters can accumulate methylmercury in their bodies. Over time, methylmercury concentrations can build up in the meat (muscle) of fish. We are exposed to contaminants when we eat fish with high levels of contaminants. Some fish have higher mercury levels than others. They include swordfish, shark, tilefish, king mackerel and

fresh tuna. If you are in the high risk or sensitive group (pregnant, planning upon being pregnant, nursing or a young child) then you should not eat these fish at all.

How can mercury affect your child?

Without even knowing it, you can build up harmful levels of mercury in your body. This can be a problem if you are pregnant or breastfeeding because mercury can be passed on to your baby, which may result in developmental problems.

The effects on your infant may be subtle or more dramatic, depending on the amount to which the fetus or young child was exposed. In instances where exposure was limited, the effects may not be apparent, such as a small decrease in IQ. In cases where exposure to mercury is substantial, the impact to the developing fetus may be serious. For example, a child may appear normal at birth but may experience developmental problems, such as walking and talking later than normal children.

What is mercury?

Year One of "Fish School"

- Illinois-Indiana Sea Grant and ISTA launch effort to recruit science, health, and nutrition teachers.

- Teachers attend workshop.

- Educators create units for their classroom.



Year Two of “Fish School”

- Students present projects at community and school events.
- Teachers present at professional conferences or teacher in-service.



*Linda Cook, 4-H Educator,
Winter Wonderland Fest
Wolf Lake, Indiana*

Evaluation

- **Teachers completed a pre- and post-survey.**
- **Receive a stipend upon project completion.**

Sample Survey Results

- Teachers get significant amount of info on contaminants from newspapers and TV.
- Spent 3-6 weeks teaching this unit.
- Take home message for students—
 - Be an educated consumer.
 - Check fish advisories.
 - Be aware of risks and vary choices.
 - In restaurant/grocery store, ask where fish came from.
 - Frying is not best way to prepare fish.

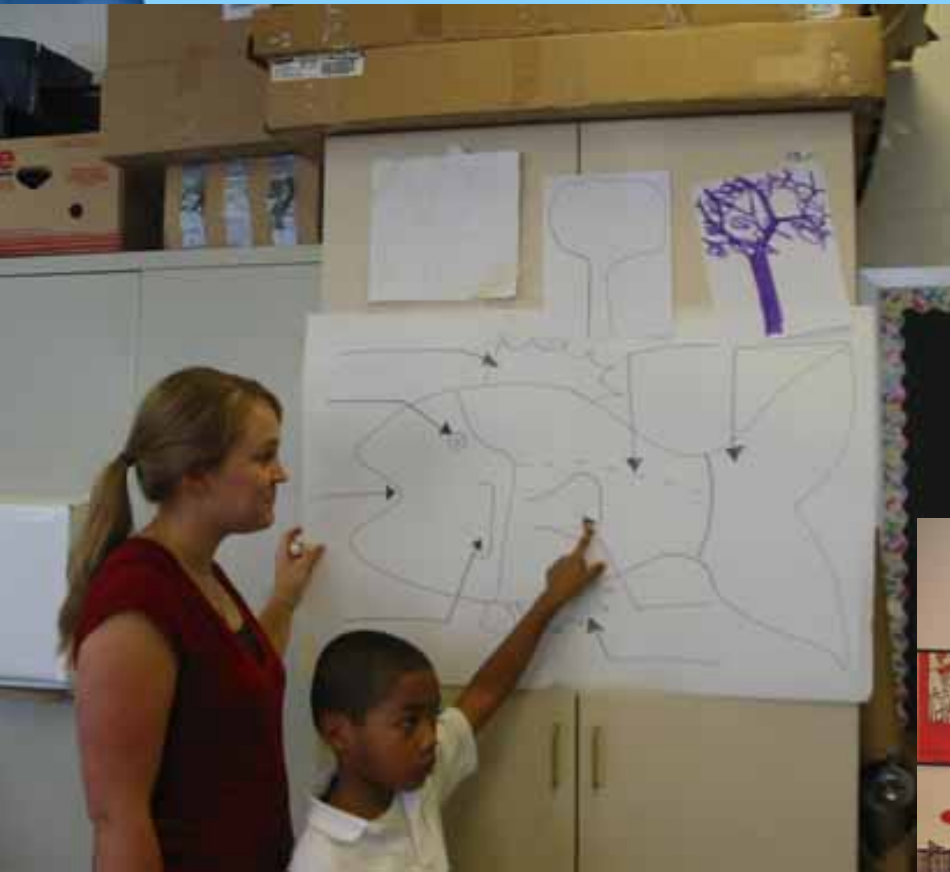
New Student Understandings

- **Became more aware of contamination issue**
 - How fish become contaminated
 - How people can get PCBs, Chlordane, and Mercury into their systems
- **Changed attitudes about concerns related to eating fish**
- **Sharing new knowledge/awareness with families and community members**

Kilmer Elementary Students Show Off their Projects



More Projects: Science and Reading



New Lesson Plans

- **What Color is your Water Today?**

Steve Schmidt, Science Teacher, Kilmer Elementary

- **Create Excitement through Learning about Fish**

Shara Fata, Science Teacher, Kilmer Elementary

- **Water Quality and Healthy Fish**

Beth Johnson, Art Teacher, Kilmer Elementary

- **Food Pyramid**

Kelly McCue, Health Teacher, Kilmer Elementary

Ways to Become Involved in "Fish School"

- **Help raise community awareness about important public health issue.**
- **Discuss with other educators how to implement in the classroom.**
- **Engage students in community service learning projects.**

Online Resources

Visit Sea Grant's Fish School Web site at:

www.iisgcp.org/edk-12/FishSchool



Education K-12

Raise Awareness/improve health through Fish School

ILLINOIS-INDIANA SEA GRANT COLLEGE PROGRAM
ILLINOIS SCIENCE TEACHERS ASSOCIATION, BUILDING A PRESENCE FOR SCIENCE
FUNDED BY U.S. EPA-GLNPD

Nutritionists agree that fish is an important dietary source of long-chain omega-3 fatty acids; however, many pollutants in the basin may cause nervous system disorders and long-lasting health effects in fetal and childhood development. For adults, exposure to mercury is primarily through consumption of commercial or sportfish. For the fetus and infant, exposure may come primarily from the mother through placental transfer or breast milk.

Fish consumption advisories, generated by health departments, are designed to protect sensitive populations from excessive exposure to these pollutants in sport fish. The U.S. EPA and FDA announced in 2004, a joint consumer advisory on methylmercury in fish and shellfish to reduce the exposure to high levels of mercury in women who may become pregnant, pregnant women, nursing mothers, and young children.

Some anglers in ethnic groups, because of culture or because of necessity, rely on fishing to supply an important part of their families' diets. Although research has clearly shown that high levels of contaminants can exist in some fish in Lake Michigan (methylmercury commonly found in Lake Michigan fish is seven million times greater than the surrounding waters) [U.S. EPA, 1999], these groups consume large quantities of fish without regard to minimizing the risk of contamination. Fish advisories have had little effect on their fish consumption behavior.

For additional information or questions, please contact Robin Goettel at 217-333-9448 or goettel@iisgcp.edu.

- Fish School Project Information
- Fish School Group Photo
- Teacher Benefits
- Sample Activities for the Classroom
 - Kilmer Elementary School, Chicago, Illinois
 - Methods and Ideas for Implementing Fish School into Curriculum
 - Taking Stock of Risks and Benefits - Test your memory about the risks and benefits of eating fish.
 - Who can Harvest a Walleye?
 - Where do all the Toxins Go?
- Fish School Publications
 - The Lowdown on Mercury
 - What You Need to Know Before You Eat that Fish! (Mercury)
 - The Lowdown on PCBs
 - What You Need to Know Before You Eat that Fish! PCBs and Your Family
 - Contaminants in Fish & Seafood: A Guide to Safe Consumption
 - Flychart version
 - Illinois version
 - Indiana version
 - Spanish version
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