

# Eating PCBs from Lake Ontario: Is There an Effect or Not?

by

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## Article

Read the following text of a recent press release.

### *Eating Lake Ontario Fish Linked to Shorter Menstrual Cycles; Consumption May Delay Pregnancy, UB Researchers Find*

**BUFFALO, N.Y.** — Eating contaminated sport fish from Lake Ontario is associated with shortened menstrual cycles, epidemiologists from the University at Buffalo have found.

They also reported that the fish consumption was associated with a small, but statistically insignificant, delay in the time it took women to become pregnant.

The results are from two separate studies that are among the first to assess the dietary effect of low-level environmental exposure to organochlorines, heavy metals and pesticides, all recognized reproductive toxicants, on the reproductive process in humans.

The studies are published in the *American Journal of Epidemiology*, which is dedicated to research by faculty members and graduates of the UB Department of Social and Preventive Medicine.

Women enrolled in New York State Angler Cohort provided the data for the studies. The cohort, composed of 10,518 male anglers, 918 female anglers and 6,651 spouses or partners of male anglers, was formed in 1991 to provide a representative sample of fishing-license-holders between the ages of 18 and 40 from the 16 counties near Lake Ontario. The sample provides a population base for a variety of studies on the implications of Great Lakes contamination.

Eating Great Lakes sport fish delivers a mixture of toxic chemicals, including PCBs, at a level estimated to be 4,300 times greater than through exposure in the air or via drinking water. Many of these chemicals accumulate in the body. Lake Ontario fish are reported to have more than twice the amount of dioxin, mirex and PCBs than fish from the other Great Lakes, a finding that has resulted in the New York State Department of Health recommending that women of childbearing age eat no Lake Ontario fish. An earlier UB study showed that most anglers are aware of the advisory, but many don't know the specific recommendations for women and didn't change habits because of the advisory.

For the two studies of fecundity and Lake Ontario fish consumption, researchers from UB's Department of Social and Preventive Medicine assessed both time-to-pregnancy, a measure that can reveal conception delays, and length and regularity of menstrual cycle, aspects that affect a woman's fecundity.

The time-to-pregnancy study, headed by Germaine Buck, Ph.D., UB associate professor of social and preventive medicine, involved 874 women who were trying to become pregnant between 1991 and 1993. Trained telephone interviewers collected information on time to pregnancy. Information on duration and frequency of sport-fish consumption was collected when participants enrolled in the cohort in 1991.

Time-to-pregnancy data were based on women's answers to questions asking if they stopped using birth control to become pregnant; if they were attempting to prevent pregnancy in any way; and during which cycle they became pregnant after deciding to try to conceive.

Consumption data showed that 42 percent of the women of child-bearing age ate Lake Ontario fish, and 10 percent reported eating fish for at least seven years, dating back to a time when lake contamination was higher than in recent years. Researchers found a small conception delay for women who ate fish, but the effect was not statistically significant.

The study on the association of fish consumption and length of menstrual cycle, headed by Pauline Mendola, Ph.D., involved data from 2,223 women from the same cohort who reported menstrual-cycle length when they were re-interviewed in 1993.

Results showed that eating sport fish from Lake Ontario more than once a month was associated with a menstrual cycle 1.1 days shorter than the cycles of women who did not eat sport fish. Among women who experience regular menstrual cycles, the reduction was half a day.

Women in the group with moderate- to high-PCB exposure due to consumption of Lake Ontario fish showed a 1.3-day average reduction in menstrual cycle compared to women who did not eat fish. The average reduction for women who experience regular cycles was half a day.

Mendola said that while these small decreases in menstrual-cycle length are not currently a major public-health concern, the findings may indicate that these environmental contaminants have an effect on hormone production, notably estrogen production, which could have larger implications.

*Source:* <http://www.buffalo.edu/news/execute.cgi/article-page.html?article=34130009>

## Assignment

Write a critique of this report. Next class period, you will hand in your written critique and should be prepared to discuss your opinions. The written critique should be printed in 12-point font, double-space lines, and your writing should be clear and concise. Included in this critique should be answers to the following questions:

## Questions

1. What was the research question for each study?
2. Describe the data collected by the 1991 New York Angler study. What questions did they ask the participants?
3. Describe the data collected by the time-to-pregnancy study. What questions did they ask the participants?
4. Describe the data collected by the menstrual-cycle study. What questions did they ask the participants?
5. This was an observational study, not an experimental study. What are the advantages of the observational approach as compared to an experiment? What are the disadvantages?
6. What do we know about their statistical analysis of the data?
7. What did the researchers determine about the relationship between PCB consumption and the amount of time it takes to become pregnant?
8. What did the researchers determine about the relationship between PCB consumption and the length of menstrual cycles?
9. Were these conclusions valid in your viewpoint? If not, why not?
10. What information is missing that would help you to evaluate this research project?
11. What would you change or add if you were in charge of answering their research questions?

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