Fish Consumption Advisories - Current Topics

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Making a Great Lake Superior Conference October, 2007
Fish Consumption Advisories

• Goal: Minimize exposure to contaminants in fish while promoting the many benefits of eating fish.
Fish Consumption Advisory Development

• National Forum on Contaminants in Fish
  – Sponsored by EPA
  – State & Tribal Fish Advisory Programs

• Great Lakes Consortium
  – Great Lakes Protocol: PCBs & Chlordane
  – Mercury Addendum, May 2007
  – Outreach
    • EPA grant to facilitate consistency
National Forum on Contaminants in Fish
July 2007

• Risk Assessment/Toxicology
• Fish Sampling and Analysis
• Biomonitoring
• Health Benefits of Fish Consumption
• Risks and Benefits
• Risk Communication

Risk Assessment / Toxicology

- Safe dose approach: If exposure is below the safe dose there should be no adverse health effects
  - US EPA risk assessment methods
  - Hazard & dose-response assessments are used to evaluate fish data to determine consumption advice

- PBDEs
  - EPA published draft risk assessment for PBDEs, December 2006
Risk Assessment / Toxicology (cont.)

• **Mercury** - International Mercury Conference, 2006

• Warning children and women of child-bearing age to be careful about the species of fish they eat is justified - enough evidence showing that exposure of the fetus to methyl-mercury will affect children’s development

• To increase the benefits and reduce the risks, consumers should choose fish with high levels of omega-3 fatty acids and low levels of methylmercury.

• To date, there is no evidence from human studies that selenium protects people from the toxic effects of mercury.
Fish Sampling and Analysis

- **PBDEs** – Two talks at the Forum
  - Total PBDE in DE Estuary fish is greater, on ave., than in fish elsewhere. Nevertheless, health risk appears relatively low. Good!
  - Washington State: some higher levels but not evaluated yet for health risk

- **EPA National Lake Fish Tissue Survey**
  - MN (17 lakes): PBDE levels not high enough to warrant advice to limit consumption

- **PFCs**
  - MN fish data for Mississippi River and some metro area lakes
  - Fish monitoring in other States/Tribes – Delaware River, North Carolina
  - No US EPA Risk Assessment
    - MN Risk Assessment for Groundwater contamination applied to fish data
    - Fish Advisories for Mississippi River and some Metro area lakes
Fish Sampling and Analysis (cont.)

• Great Lakes / Lake Superior Monitoring
  – States & Tribes
    • Routine monitoring by states: mercury and PCBs
    • Some special studies of other contaminants

  – Great Lakes Fish Monitoring Program
    • Historical and emerging contaminants

  – Ontario
    • Historical and emerging contaminants
Great Lakes Fish Monitoring Program (GLFMP) Contaminant List

- PCB congeners
- PCB co-planers
- Hexachlorobenzene
- Octachlorostyrene
- Lindane
- Alpha BHC
- Dieldrin
- Heptachlor epoxide-b
- Cis-chlordane
- Trans-chlordane
- Oxychlordane
- Cis-nonachlor
- Trans-nonachlor
- pp, -DDT
- pp, -DDE
- pp, -DDD
- Endrin
- Mirex (Lake Ontario Only)
- Toxaphene & homologs
- PBDEs
- Hg
- Fraction Lipid
- PCDD/Fs
- o PCNs
  - APEs
  - PPCPs
  - BFRs
Biomonitoring

- Monitoring contaminants in fish is “biomonitoring” – indirect assessment of human exposure through fish consumption

- Alaska - Using mercury human biomonitoring to determine if fish consumption advice is needed
  - Previously no advice to limit consumption of Alaskan fish

- NYC residents - mercury exposure higher than national average; Asian women and higher income adults (published in EHP)

- WI - PBDEs in Great Lakes Charter Captains
  - PBDE exposure: increased with age, obesity, water bed use, hours spent outdoors, PCB and DDE levels, years of sportfish consumption, shellfish meals per year & lower income
Biomonitoring (cont.)

• Mercury in WI Residents
  – 2004 mercury biomonitoring project
    • highest exposures: Males, age over 50, sportfish consumption, ingestion of > 8 fish meals/month
  – New project to follow-up on highest exposures to evaluate effectiveness of the 2004 project as an educational tool (EPA GLNPO grant)

• Mercury Bloodspot Project
  – Measure mercury in residual blood spots from newborns in the US Lake Superior Basin (MN, MI, WI) (EPA GLNPO grant)
Benefits and Risks of Fish Consumption

• Benefits and risks depend on fish eaten and who eats the fish
• Fish are not all equal
• Benefits (women & kids))
  – Enhances fetal eye development
  – Increased duration of gestation
  – Cognitive benefits
• Benefits (Adults)
  – Reduces cardiovascular risks
Eat Fish

• If Fish Consumption Advice is followed
  – Developmental benefits
• If Fish Consumption Advice leads to fish avoidance
  – Increases risks
Balancing Risks and Benefits
IOM Report 2006

• Good review of available literature
• Include seafood in diet
• Women and kids = follow EPA/FDA advice
• General Population = eat 2 meals fish per week. If eat more then choose a variety of species.
• Qualitative not quantitative assessment
2004 EPA / FDA Advisory

• For women of childbearing age and children
  – Four species on “Do not eat” list
    • Shark, swordfish, king mackerel and tilefish
  – Eat variety of other species 12oz (2 meals/week)
    • Except albacore tuna only 1 meal/week in addition to a meal of other fish
• Defers to State advisories for locally-caught fish
Eat Fish

• Overall agreement that people should eat fish, most people should eat more fish
  – Make choices –
    • Eat low mercury, high omega-3 fish
  – Some fish are high in mercury
    • Avoid or eat in moderation
Great Lakes Protocol – Benefits

- Fish can be part of a healthy, balanced diet.
  - generally low in saturated fat and high in protein
  - contain a number of vitamins and minerals, and
  - are the primary food source for omega-3 fatty acids
    - beneficial during fetal brain and eye development
    - may lower the risk of heart disease in adults.

- Health experts recommend that regular consumption of fish be included as part of a healthy diet.
Lake Superior Basin
Fish Consumption Advice

- MN, WI, MI, Tribes, Ontario
- GLNPO Fish Monitoring Program Website
  - [http://www.epa.gov/gllnpo/monitoring/fish/index.html](http://www.epa.gov/gllnpo/monitoring/fish/index.html)