



Proceedings of the 2007 National Forum on Contaminants in Fish

Section II-G Risk Communication

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Fred Corey, Aroostook Band of Micmacs

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Dan Kusnierz, Penobscot Nation

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Steve Bradbard, Food and Drug Administration

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Evaluating Risk Communication for Fish Advisories

Missy Cody, Georgia State University

Biosketch

Dr. Mildred Cody (Ph.D., R.D.) is the Head of the Division of Nutrition at Georgia State University. She earned her B.S. degree in Chemistry and her M.S. degree in Nutrition at the University of Georgia, and she received her Ph.D. in Food Science from Rutgers University. Dr. Cody began her professional career serving on the faculty at New York University (NYU) and as a Science Advisor to FDA for the Brooklyn District in the area of food chemistry. Following 4 years at NYU, she spent 5 years as a Specialist in Consumer Food Safety and Nutrition for the Clemson University Cooperative Extension Service. Since then, she has worked at Georgia State University in areas related to consumer food safety issues, health professional training, and population surveys related to food safety issues.

Abstract

The focus of this presentation is measuring the impact of face-to-face presentations of fish advisories for local areas. Two primary goals of these evaluations are to measure the impact of advisories and to improve future advisories. Because advisories provide information to promote specific behaviors for target populations, evaluations of advisories typically include measurements of knowledge (information), attitudes (promotion or motivation), and behaviors (intended or actual). Awareness of advisories and access to them by the target groups also affect the impact of advisories and are important elements in their evaluation.

Evaluation can be complex with national sampling and validated instruments; however, evaluation can start more simply and still provide important information on effectiveness of advisories in reaching target populations and promoting recommended behaviors. This presentation will provide sample questions and measures that can be adapted for use in communities as a starting point for the evaluation process.

Evaluating Risk Communication Outcomes for Fish Advisories

Missy Cody, PhD, RD
Georgia State University

Goals of Evaluation

- To measure IMPACT: % of target population that adopts (or retains) recommended behaviors

- To improve future advisories to increase impact, especially for target

Formal Evaluation Process

- Establish what you want to know
- Determine short-term and long-term measures that answer your questions
- Develop tools to perform evaluation
- Validate tools and process
- Conduct evaluation and analyze data
- Repeat to establish changes over time or with different populations

What to Evaluate?

- Advisories
 - Give information
 - To promote (motivate)
 - Specific behaviors for
 - Target populations
- Evaluate
 - Information (knowledge and comprehension)
 - Promotion (attitude)
 - Behaviors (actions or intent; barriers)
 - Awareness and access by target group

Evaluating Information

- Immediate Transfer – knowledge and comprehension (short term)
 - Risks
 - Benefits
 - Recommendations (including “who” and “how to”)
- Retention and changes (longer term)
- Measures
 - What is recommended for ...
 - Making better choices from a group ...
 - Explaining limits and reasons for choices

Sample Questions

- Which of these fish have high methyl mercury contents in our area? Check all that are high.

- Which of these menu choices are likely to be high in methyl mercury? Check all that are high.

- Which household member(s) should limit intake of x to y per month? List all members that come under this recommendation.

Evaluating Attitudes

- Importance
 - to attendee
 - to attendee's circle
- Credibility
 - trust, checking with others
 - mores and ways of knowing
- Measures
 - ranking importance with other relevant factors (for self and significant others)
 - Listing of other information sources, and which is authoritative

Sample Measures

- Do you plan to share this advisory with anyone?
 - If you plan to share the advisory, who do you plan to share it with and why?
- Are you questioning some of your current activities based on the advisory?
 - If so, what activities are you questioning?
 - If so, who else will you consult to help you decide what to do?

Evaluating Behavior/Intent

- Intent – short term plans
 - using information
 - Making choices for household (home-prepared)
 - Making choices for self (restaurant)
 - changing behaviors or retaining recommended behaviors
 - sharing information
- Behavior – longer term
 - Self-reported
 - Observed

Sample Measures

- What recommendations from the presentation do you plan to follow for yourself when you order food in a restaurant?
- What recommendations from the presentation do you plan to follow when you share your catch with friends and family members?
- What would make it difficult for you to follow the recommendations?

Evaluating Access to Target

- Who is in the audience?
- Do they plan to share their information with target audiences?
- Where have they seen information?
- Where have they sought information?
- What other authorities will they use?
- Why did they come to the presentation?

Asking v Validating

- Short term evaluation usually asks for information
- Validation requires other measures, usually observation of individuals or quantification of indicators
 - Restaurant orders
 - Grocery purchases
 - Retained/consumed catches

Evaluation Answers Questions

- Was the advisory effective?
- Were there unintended consequences?
- Do we need to reach additional audiences?
- What can I improve?
- What other authorities do I need to help carry the message?

Questions and Answers

Q. What magnitude of behavioral changes are expected in the first issuance year of an advisory? (Santerre)

A. Expect less than 20% behavioral modification and less than that each following year. It is very difficult to reach more than 60% of the population. EPA has a partnership for effective communication.

Q. When an advisory is issued, is it better to say that the statement is from a department, state, or government? (Groetsch)

A. Research states that you are better off listing as many authoritative organizations as possible, even if some organizations are not typically thought of as authoritative (e.g., the Rotary Club).

Q. There are many groups that give fish advice. Oftentimes, the messages are somewhat different. How do we reach through all of these messages and get ours across?

A. Ideally, a consistent message is desired. Otherwise, it is important to explain the difference between your advice and another group's advice (i.e., the federal government says this, but ours [our advice] is a little different because our waters are ...).

Q. Does endangered species advice also have an impact on consumers (e.g., dolphin-safe tuna)?

A. It does have an impact, but usually only on those who have that interest in endangered species (and the percentage is low). However, green is growing.

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Awareness of Mercury among Pregnant Women (EPA/FDA National Study)

Steve Bradbard, Food and Drug Administration

Biosketch

Dr. Steven Bradbard (Ph.D.) supervises a multidisciplinary consumer studies staff at the FDA's Center for Food Safety and Applied Nutrition (CFSAN). His team of eight social scientists conducts consumer surveys, experiments, focus groups, and other communications research to support government regulations and policy related to food safety and applied nutrition. Dr. Bradbard completed his undergraduate and graduate training in Psychology at the University of Maryland. Prior to joining CFSAN in 2001, Dr. Bradbard served as Research Director for a private firm in Washington, D.C., where he specialized in risk communication and social marketing campaigns for federal agencies. He helped develop research-based health and safety campaigns for the National Institutes of Health, EPA, and the U.S. Department of Transportation. Dr. Bradbard served as the co-investigator for the focus groups that were conducted in 2003–2004 to inform the format and content for the 2004 joint FDA–EPA methylmercury advisory. He is also a member of the research team that is currently evaluating consumer awareness and understanding of the Mississippi Delta advisory.



Abstract

In 2004, the U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA) released a joint advisory addressing methylmercury in seafood. The advisory provided pregnant women, nursing mothers, women of child-bearing age, and caregivers for young children with recommendations for consumption of commercial and wild-caught fish. FDA and EPA collaborated to assess the impact of the advisory on consumers' awareness and understanding and reported behaviors related to the information found in the advisory. A mail survey of almost 5,000 women in their seventh month of pregnancy found that approximately two-thirds of them were aware of mercury as a problem in food and that more than 80% of those were aware linked the problem to fish. Younger pregnant women (ages 18–24 years) were less likely to have heard of this problem than any older group of women. Black and Hispanic women and those women with less education and lower income were less aware of this problem. Also, WIC participants were less likely to be aware of this problem than were non-participants. Eighty percent of the pregnant women in the sample reported not eating swordfish, shark, tilefish, or king mackerel before or during their pregnancy. An additional 13% said they ate less of these fish during their pregnancies. Among those women who reported reducing their consumption of fish, more than 75% said the reason was that it may harm their babies.

Awareness and Understanding of Mercury among Pregnant Women



FDA Center for Food Safety and Applied Nutrition

EPA Fish Forum
July 27, 2007



Background

- 2003-2004 FDA/EPA Focus Groups
 - Develop concise and understandable consumption advice
- 2004 Joint Advisory
 - Concerns about actual message conveyance and knowledge utilization



Objective

- Assess level of awareness of mercury as a problem, extent of association with seafood, changes in seafood consumption, and sources of information about diet during pregnancy.



Infant Feeding Practices Study II

- Longitudinal mail survey of pregnant women and mothers of healthy singleton infant through age 12 months.
- Over 4800 pregnant women sampled from the Synovate Global Opinion Panel.
- Sample was nationally distributed, but not representative of the US population.
- Data collection for prenatal questionnaire collected at seven months pregnant.
- New sample every month from May-December 2005.



Level of awareness

- 68% of women overall had heard of problems in food related to mercury.
- Younger pregnant women (18-24 years) were less likely to be aware than any older groups.
- Black and Hispanic women were less likely to be aware.
- Women with less education were also less likely to be aware.



Awareness by age

Age	N	Yes
18-24 years	1364	54.3%
25-29 years	1571	69.6%
30-34 years	1214	74.8%
35+ years	718	76.5%



Awareness by race



Race	N	Yes
White	3846	69.8%
Black	297	51.2%
Hispanic	334	60.5%

Awareness by education



Education	N	Yes
HS or less	1037	55.3%
Some college	1752	68.0%
College graduate	1480	83.1%

- ### Association of mercury with seafood
- Of those women who were aware of mercury as a problem in food, most linked it to fish and shellfish, and not to other foods.
 - Of those who were aware, all demographic categories associated mercury with fish.
 - Less than 1% associated mercury with meat, chicken, cheese, or luncheon meats.
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Association by age

Age	Some types of fish	All types of fish	Some types of shellfish
18-24 years	80.4%	15.9%	34.3%
25-29 years	84.3%	14.7%	33.0%
30-34 years	85.9%	13.1%	30.8%
35+ years	84.4%	13.8%	33.3%



Association by race

Race	Some types of fish	All types of fish	Some types of shellfish
White	84.6%	13.8%	32.7%
Black	81.1%	16.9%	26.4%
Hispanic	77.8%	16.7%	32.3%


Association by education

Education	Some types of fish	All types of fish	Some types of shellfish
HS or less	81.0%	15.6%	29.7%
Some college	82.7%	15.4%	32.8%
College graduate	88.6%	11.8%	33.6%



Changes in fish consumption

- For pregnant women both aware and unaware of mercury as a problem, 80.4% said they “did not eat before or do not now eat” swordfish, tilefish, shark, or king mackerel.
- 13.1% reported now eating less of those fish.
- 5.8% said they eat about the same amount as before.
- 0.8% said they are now eating more.



Changes in fish consumption

- For pregnant women both aware and unaware of mercury as a problem, 24.6% said they “did not eat before or do not now eat” canned tuna.
- 27.4% reported now eating less canned tuna.
- 40.5% said they eat about the same amount as before.
- 7.6% said they are now eating more.



Changes in fish consumption

- For pregnant women both aware and unaware of mercury as a problem, 51.5% said they “did not eat before or do not now eat” shellfish.
- 18.4% reported now eating less shellfish.
- 28.0% said they eat about the same amount as before.
- 2.1% said they are now eating more.

Changes in fish consumption



Type	Eat More	Eat Less	About the Same	Not Now or Before
The 4 “no-no’s”	0.8%	13.1%	5.8%	80.4%
Canned Tuna	7.6%	27.4%	40.5%	24.6%
Shellfish	2.1%	18.4%	28.0%	51.5%
Any other type fish	5.5%	19.3%	38.2%	37.1%

Reasons for eating less seafood



- The reason provided most often by pregnant women for eating less seafood is that it may “harm the baby.”

The forbidden 4	86.9%
Canned Tuna	74.4%
Shellfish	75.6%
Any other type of fish	75.8%



Preferred information sources



- Pregnant women most frequently rely on a health professional for information about their diet or about feeding their babies.
- They also turn to educators, friends/relatives, books/videos, and print/broadcast media for this information.
- While they also get information from websites, they very rarely look at government sites.








Information sources



MD, nurse, or other HCP	81.3%
WIC educator	37.9%
Relative/friend	52.6%
Book/videos	61.8%
Newspapers/magazines	55.4%
TV/radio	20.3%
Non-government website	28.1%
Government website	3.0%

- ### Summary of findings
- Among pregnant women, awareness of mercury as a problem is high.
 - Pregnant women link seafood to mercury.
 - The reason most often reported for eating less seafood is that it may harm the baby.
 - Most pregnant women receive dietary advice from a health care provider. Very few look for information on government websites.
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- ### Some concerns
- Younger women, Black and Hispanic women, and those with less education were less aware of mercury as a problem in food.
 - While few pregnant women eat the four forbidden fish, many have also greatly reduced their consumption of canned tuna, shellfish, and other types of seafood.
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- ### Future analyses
- While we know if pregnant women did eat seafood before or during pregnancy, we do not yet know how much they ate.
 - We are currently analyzing dietary intake data from pregnant women and from women at four months postpartum (many of whom were breastfeeding). We will use this data to report how much fish of each type pregnant and breastfeeding women ate.
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- ### Additional Research
- We have completed data collection from the 2006 Food Safety Survey. This nationally representative survey includes questions assessing adults' awareness of the advisory and beliefs/concerns about eating fish.
 - We will soon conduct a survey of OB-GYNs, physician assistants and nurse practitioners, nurse midwives, and WIC educators.
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Questions and Answers

- Q. Are there plans to analyze these data on a state level, or are the number of surveys too few to be analyzed at anything other than a national level? Also, are there plans to coordinate data gathering with state surveys? (Frohmborg)*
- A. We have lots of additional analyses by regions and more. We are interested in coordinating with the states; however, the timelines to conduct and organize the survey federally are generally different and longer than most state timelines.
- Q. The NHANES [National Health and Nutrition Examination Survey] data tend to suggest that the fish included in the national mercury advisory are uncommonly eaten. Also, people of Asian or Island descent tend to have more fish consumption, but I didn't see those data in your talk. Is it possible to get and analyze the data specifically for those groups? (Mahaffey)*
- A. We do have ethnicity data, but we don't know if the sample size is large enough.
- Q. There was a big push to get the advisories in the hands of OBGYNs [obstetricians/ gynecologists] and pediatricians in the past, but not so much anymore. Will there be another push? Also, do you think we should put the advisory information in supermarkets? (Warner)*
- A. Outreach and packets for physicians continue to be sent out. While it does make sense to have advisory information in the supermarkets, it's tough to get the markets to want to put the information out.
- Q. Do you think we should be informing people of the benefits of consuming fish along with advisories? (Burger)*
- A. We have done this in the past by making the information available alongside the advisory in booklets and other outreach materials.
- Q. Can you post your survey publicly so we can look at the questions and possibly use some of them for our state surveys? (Lee)*
- A. These are public documents on the dockets Web site, or you can e-mail Sara Fein for more information.
- Q. Are there efforts to communicate to the study group what types of fish to eat and in what quantity, that is, communicate the health benefits of fish consumption as well? (Morris)*
- A. In general, pregnant women are a very risk-averse group, and we do have a real problem getting them to realize fish is an important part of their diet.
- Q. Communication of this study has been relatively passive, and it should probably be more active to help states in their surveys and/or receive help from the states. For instance, we would like to use the questions. (Anderson)*
- A. I will bring the message back to the center, but I do think that it is a resource issue. The agency has been shrinking greatly, but we will pass on the idea that outreach and coordination would be appreciated.

Application of Hair-Mercury Analysis to Determine the Impact of Seafood Advisory in the Faroes

*Pal Weihe, Department of Occupational and Public Health, The Faroese Hospital, and
Philippe Grandjean, Institute of Public Health, University of Southern Denmark*

Biosketch

Dr. Pal Weihe has served as Head of the Department of Occupational Medicine and Public Health in the Hospital System of the Faroe Islands since 1988. Dr. Weihe received his M.D. from the University of Copenhagen in 1977 and received his postgraduate training in Denmark and Sweden. He is affiliated with the University of Southern Denmark as a research lecturer and with the Harvard School of Public Health as a visiting scientist. For 20 years, Dr. Weihe has conducted cohort studies on the impact of marine contaminants on children's health in the Faroe Islands.

Abstract

Faroe Islanders have consumed pilot whales for hundreds of years; however, pilot whale meat has been found to be contaminated with methylmercury and the blubber with persistent organic pollutants (POPs), including polychlorinated biphenyls (PCB) and dichlorodiphenyl dichloroethene (DDEs). Since 1985, studies have been conducted in the Faroe Islands to establish the exposure levels in pregnant women and the potential adverse effects of pollutants on the fetuses. Current evidence from the Faroe Islands indicates that prenatal exposure to methylmercury and, to a lesser degree, PCBs may impair fetal and childhood development. In August 1998, the Faroese health authorities advised women to reduce their intake of pilot whale meat and blubber to protect the fetus against adverse effects from these food contaminants.

A dietary survey was conducted 2 years after the advisory. All together, we obtained 409 24-hour recall interviews and a total of 732 food diary recordings. The results from the dietary survey showed a significant reduction in whale meat and blubber intake, and blood analysis showed a corresponding reduction in the mercury (Hg) exposure. The hair Hg in pregnant mothers had shown a steady decline the last two decades; however, the PCB levels are still high and must be considered to be a potential health problem in the Faroese community.

In the Faroese diet, the pilot whale is the main source of Hg and POPs. The concentrations of Hg in the most common fish species consumed in the Faroe Islands (e.g., cod and haddock) are low (approximately 0.05 ppm), compared to the concentrations in pilot whale meat (2–3 ppm). Accordingly, the public health authorities in the Faroe Islands have not advised people to reduce their intake of fish.

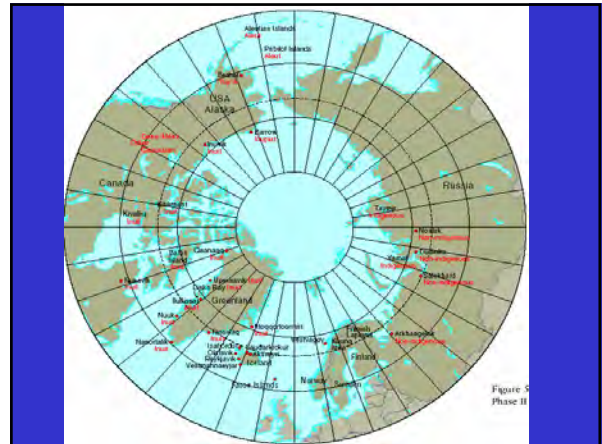
Application of Hair-Mercury Analysis to Determine the Impact of Seafood Advisory in the Faroes

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The Faroes - a Welfare Society

- Home rule within the kingdom of Denmark
- 50.000 inhabitants
- Seafood dominating export
- Free education
- Free health care
- Retirement pension for all

Health indicators

- Perinatal mortality: 4,1/1000 (2000-2005)
- Life expectancy at birth: 81/77 years (women/men)
- Cause of death distribution similar to Scandinavia
- Tobacco : 23 % daily smokers
- Alcohol consumption: 6,7 liter/person/year

Why MeHg research in the Faroes?

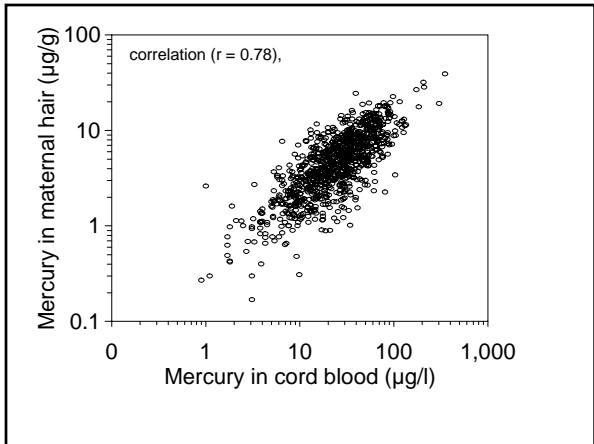
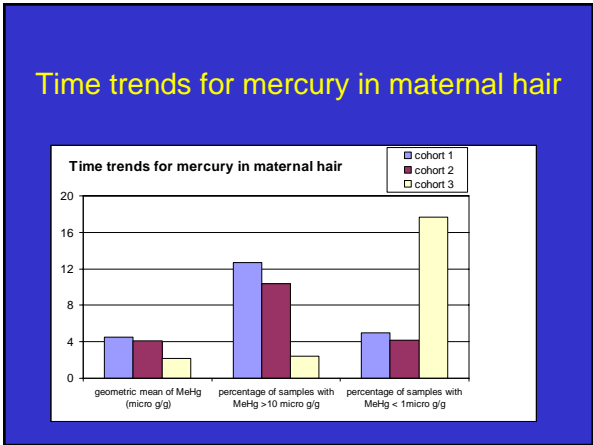
- Exposure to MeHg from pilot whale meat has been almost like a natural experiment - highest level was 1000x the lowest
- Exposure only weakly associated with confounders
- Average 3 fish dinners/week, whale meat 1-2/month
- Homogeneous, Nordic fishing community
- High participation rate (about 90%)

- Cohort 1 born in 1986-1987 (N = 1022): pre- and postnatal exposure to methylmercury and neurobehavioral development, examined at ages 7 and 14, and now again at ~21 years (2007-2009)
- Cohort 2 born in 1994-1995 (N = 182): PCB and xenoestrogen exposure, frequent follow-up, most recently at ages 7 and 10 years
- Cohort 3 born in 1999-2001 (N = 650): food contaminants, overall development, neurotoxicity and immunotoxicity, follow-up at ages 5 years and (now) 7 years
- Cohort 4 born in 2007-2008 (N ~ 500): neurotoxicity

- ### Samples obtained in the Faroes for mercury analysis as exposure biomarkers
- Cord blood
 - Cord tissue
 - Maternal hair at parturition
 - Child hair at 12 months
 - Child blood and hair, 7 years
 - Child blood and hair, 14 years

Mercury in maternal hair (µg/g)

	N	Mean	Median	Minimum	Maximum
Cohort 1 1986/87	1,020	5.6	4.6	0.17	39.1
Cohort 2 1994/95	144	5.3	4.5	0.36	16.3
Cohort 3 1999/00	617	3.1	2.2	0.02	32.7

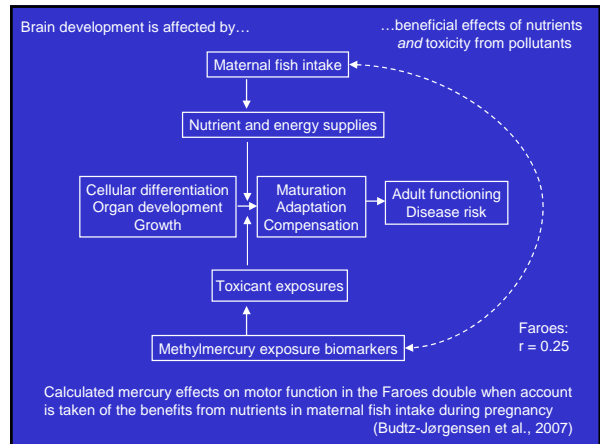


Predictive validity

	Regression coefficients (%SD/2*Hg)		
	Blood	Hair	Whale
Motor speed	-5.8*	-6.0*	2.8
Attention	15.9***	9.0*	8.3
Visuospatial	3.6	3.6	1.3
Language	-10.7***	-7.5**	11.3**
Verbal memory	-6.6*	-5.9*	9.0*

Conclusions on exposure assessment

- Developmental toxicity risk best determined by Hg in cord blood
- Hair is excellent for monitoring purposes



Recommendation on pilot whale meat (August 1998)

'The mercury content of pilot whale meat is high and is one of our main mercury sources. Therefore we recommend that adults eat no more than one to two meals a month. Women who plan to become pregnant within three months, pregnant women, and nursing women should abstain from eating pilot whale meat.'

Recommendation on blubber and organs (August 1998)

'High PCB contents in blubber lead us to recommend that adults at the maximum eat pilot whale blubber once to twice a month. However, the best way to protect foetuses against the potential harmful effects of PCB's, is if girls and women do not eat blubber until they have given birth to their children. Pilot whale liver and kidneys should not be eaten at all.'

Intervention Study 1999

- All women between 26-30
- 1180 were contacted by mail, Febr. 1999
- 35% replied
- Geometric mean in 388 hair samples: 2.53 microg/g
- Hair-mercury higher where whale meat available (3.03µg/g vs.1.88 µg/g; p=.001)

Intervention Study 2000

- In March 2000 a second letter was sent to the same group for follow-up
- 145 repeat hair samples were collected and 125 new responders.
- 270 women geometric mean: 1.77 µg/g
- 145 women sent hair on both occasions: (geom. mean 2.49 vs. 1.83 µg/g; p<0.001)

Diet of 650 pregnant women 1998-99

- 30% ate pilot whale meat about as often during pregnancy as before
- 70% had decreased their consumption

Pre-Advisory Cohort

- 182 mother/child
- established 1994
- exposure data from mothers serum, cord blood, milk, hair
- analysed for POP's, mercury, fatty acids
- dietary interview about traditional food and breast feeding 7 months p. p.
- clinically examined at the age of 14 days, 7, 18, 30, 42, 54, 66, 72 and 90 months
- neuropsychological dysfunction related to mercury

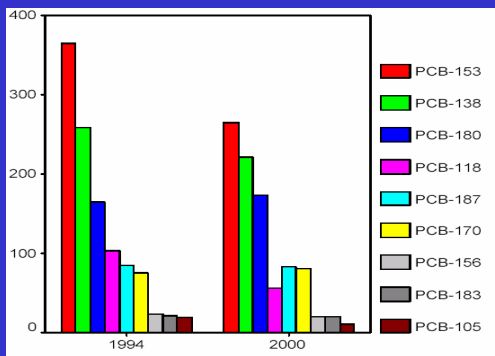
Post-advisory Cohort

- established 2000/2001
- 148 women in third trimester of pregnancy
- interviewed week 28, 32 and 38 of pregnancy
- 3 times 24h. recall
- 6 diet registrations
- 1 12 months retrospective frequency estimate
- blood sample in 34. week

Main Results in Cohort 4 1980 Values in ()

Pilot whale meat in average pr. day	1,02 g (12 g)
Pilot whale blubber in average pr. day	0,51 g (7 g)

Average concentrations of main PCB congeners in the pre-advisory (1994) and post-advisory (2000) cohorts (in ng/g lipid)



Reduction in Mercury Exposure

- Cord blood mercury concentration in 1023 births in 1986/87: 24,2 microgram/l (median), 25% exceeding 40 microg/l
- Blood from 126 women in 34. week of pregnancy 2000/2001: 1,4 microgram/l (median)
- Only 2,4 % exceeding the 5,8 mikrogram/l limit

Faroese Diet 1981-82 daily average intake per person
Source: Vestergaard & Zachariassen, Fróðskaparrit 1987

- Milk products: 390 g
- Meat: 68 g
- Fish: 72 g
- Vegetables: 224 g
- Bread: 215
- Meat from pilot whales: 12 g
- Blubber from pilot whales: 7 g

Faroese Diet 2000-2001
daily average intake per person (pregnant women)

- Milk products: 517 g
- Meat: 155 g
- Fish: 38 g
- Vegetables: 272 g
- Bread: 323
- Meat from pilot whales: 1,4 g
- Blubber from pilot whales: 0,6 g

Mercury in cod wet weight in $\mu\text{g/g}$

- 1977/78: 0,03 (N= 557)
- 1994: 0,01 (N= 25)
- 1997: 0,03 (N= 44)
- 2000: 0,02 (N = 49)
- 2001: 0,02 (N = 25)

Conclusion

- Whale meat is the dominating mercury source in the Faroese population
- Marine fish, commonly consumed in the Faroes, are low in mercury
- Dietary advisories and public information have focused on whale meat and blubber
- Fish consumption recommended

Questions and Answers

- Q. Have you studied the change in hair mercury levels during the pregnancy period? (Hinners)*
- A. We have made some segment analyses, but we have not found that concentrations have changed over the period.
- Q. How is the benefit of cord blood relevant over the pregnancy period? Do you think it is relevant over the entire pregnancy?*
- A. Cord blood mercury is an expression of the most recent exposure and may not correspond to the mercury levels across the entire pregnancy. If you look at the whole hair in the maternal, however, there was a small difference between whole hair and cord blood mercury levels.
- Q. Was the observed shift in diet associated with overall well-being? (Hortz)*
- A. The study focused on the pregnant population. It is my general impression that fish consumption has gone down for the entire population; however, any change in public health has not directly been observed.
- Q. PCB levels have not appeared to change. Do you think people are not reporting whale meat consumption because you told them not to consume whale meat? (Sekerke)*
- A. There was a correlation between what the population reported to have eaten and blood mercury levels, so I don't think they are withholding. The only thing we can do is perform the study again as soon as possible.

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State Efforts to Evaluate Impacts of Fish Advisories:

Great Lakes Basin: Assessing a Decade of Fish Consumption Advisory Efforts

Henry Anderson, Wisconsin Department of Health and Human Services

Minnesota Fish Consumption Advisory Evaluation

Pat McCann, Minnesota Department of Health

Maine's Evaluation of Risk Communication Efforts

Eric Frohberg, Maine Center for Disease Control

New Mothers' Nutritional Awareness Survey

Karen Knaebel, Vermont Department of Environmental Conservation

Communicating the Indiana Fish Consumption Advisory

Charles R. Santerre, LaNetta Alexander, and Jim Stahl, Purdue University

Abstract

An initial part of any risk communication effort involves crafting the message. Next, the message must be delivered. Finally, the impact of the message should be measured so that the previous steps can be optimized. In other parts of the Forum, presenters have discussed techniques for improving sample collection and analysis. In this session, we will provide examples of messages that have been crafted for selected audiences. Presenters will also discuss delivery and outcome assessment. A brief panel discussion will follow.

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Great Lakes Basin: Assessing a Decade of Fish Consumption Advisory Efforts

Henry Anderson, Wisconsin Department of Health and Human Services

Biosketch

Dr. Henry Anderson received his M.D. degree from the University of Wisconsin Medical School in 1972. He is certified by the American Board of Preventive Medicine with a subspecialty in Occupational and Environmental Medicine and is a Fellow of the American College of Epidemiology. Dr. Anderson is Chief Medical Officer and State Environmental and Occupational Disease Epidemiologist with the Wisconsin Department of Health and Family Services. He has adjunct professor appointments in Population Health in the Wisconsin School of Medicine and Public Health and the Gaylord Nelson Institute for Environmental Studies. Over the past 25 years, he has conducted multiple research projects investigating human health hazards of consumption of Great Lakes and other sport fish and developed and evaluated the effectiveness of public health advisories.

Great Lakes Basin

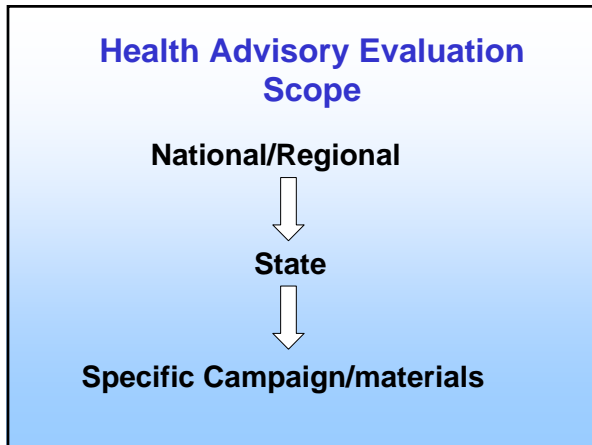
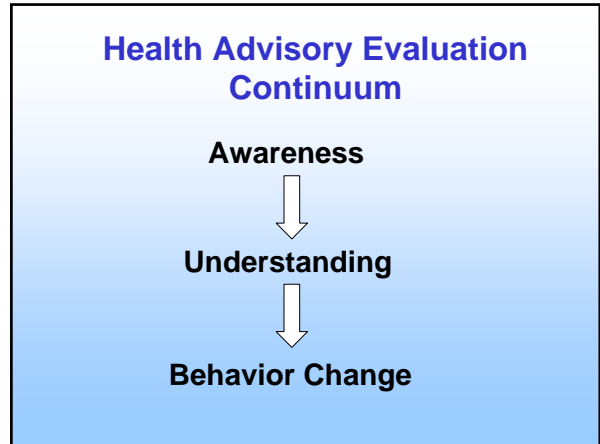
Assessing a Decade of Fish Consumption Advisory Efforts




Henry A. Anderson, MD.*
Chief Medical Officer
WI Division of Public Health
Madison, WI



*On behalf of the WI BEOH Program Staff and the GL Consortium




Regional Advisory Awareness Great Lakes Sport-fish Consumers by Sport-fish Consumption Level




	Awareness Prevalence 1994	Awareness Prevalence 2002
< 6 meals/yr	45 %	40%
6 – 24 meals/yr	50 %	57%
24+ meals/yr	62 %	70 %

Regional Advisory Awareness Great Lakes Sport-fish Consumers by Gender and Race

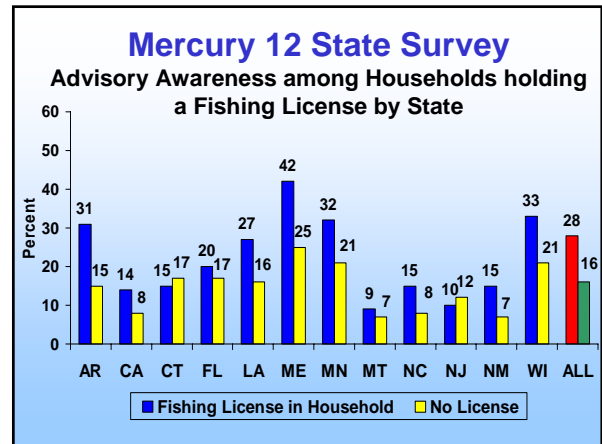
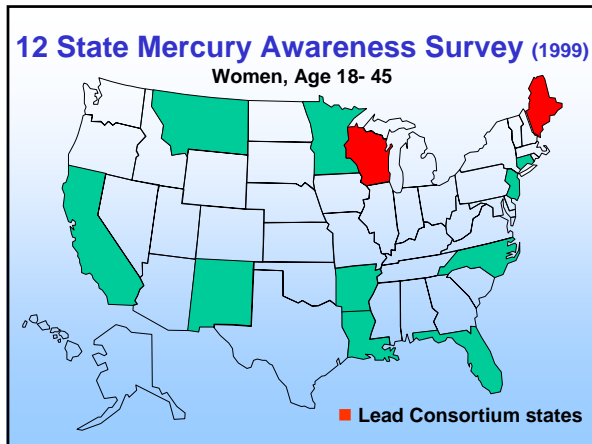


	Awareness Prevalence 1994	Awareness Prevalence 2002
Males	58 %	65%
Females	39 %	30 %
White	52 %	55%
Non-White	22 %	15 %

Self-Reported Compliance with Advisory Components Among Great Lakes Sport-fish Consumers



	1994		2002 Always Comply
	Always Comply Men	Always Comply Women	
Cooking/cleaning	69 %	55 %	77 %
Consumption Frequency	50 %	43 %	52 %
Species/Size	50 %	29 %	63 %
Fishing Locations	44 %	28 %	71 %



Additional Studies in Wisconsin

- 4,206 BRFSS participants (2004) – Statewide
- 2,000 adult hair donors (2004) – Statewide
- 1,154 WIC Clinic Participants Study (2003) - Campaign
- 1,000 consecutive births survey (2003) - Campaign

Awareness of State Advisory

BRFSS and Hair Donor Survey

- Are you familiar with Wisconsin's sportfish consumption advisory?

	Yes
BRFSS	42%
Hair donors	78%

Survey of 1,000 Women Who Gave Birth June 1-7, 2003

Intervention Evaluation

Hook into Healthy Fish!

What you should know if you are pregnant, planning to be pregnant, breastfeeding or if you are a child under age 15. Includes safe eating guidelines for fish from Wisconsin lakes, ponds, and rivers and for fish bought in restaurants and stores.

1 meal per WEEK
1/2 of Current Light Tuna** (8 oz. can = 1 meal) OR 1/2 of OTHER

1 meal per MONTH
Any sport fish species (sport fish are any fish you catch or are given, such as bass, walleye, northern pike, or croaker). Sport fish are NOT fish you purchase in a store or restaurant.

NEVER EAT
ANY SWORDFISH, SHARK, KING MACKEREL, OR FLESH

Always, consult, check catches, white catfish, yellow perch, bullheads OR Any commercial fish (fish you buy in a store or restaurant)

Have you seen either poster?

- Hook Into Healthy Fish • 2%
- What Women of Childbearing Age Should Know • 11%
- Both posters • 3%
- Don't recall seeing either poster • 83%

How much do you know about the guidelines for eating sport fish?

- A lot • 2%
- Some • 16%
- Only a little • 28%
- Nothing • 53%
- Left blank • 1%

Great Lakes Basin Fish Consumption Advisories

Always Room for Improvement!!



Minnesota Fish Consumption Advisory Evaluation


Pat McCann, Minnesota Department of Health

Biosketch

Ms. Pat McCann is a Scientist with the Minnesota Department of Health. She received a B.S. degree in Chemical Engineering from the University of Minnesota Institute of Technology in 1984 and an M.S. degree in Environmental Health from the University of Minnesota School of Public Health in 1995. Ms. McCann coordinates the Fish Consumption Advisory Program at the Minnesota Department of Health. She is involved in site selection for sampling fish for contaminants, performing data analysis, researching the health effects of fish contaminants, developing consumption advice, and communicating this advice to the public.


Minnesota Fish Consumption Advisory Evaluation

Pat McCann
National Forum on Contaminants in Fish
July 25, 2007




Evaluation

- ★ Awareness
- ★ Comprehension
- ★ Action
 - Intended/desired action
 - Reduce exposure if necessary, eat fish
 - Undesired
 - Stop eating fish




Awareness

- ★ Creel Surveys
- ★ WI/ME 12 state study of women of childbearing age
- ★ DNR Angler Attitude Surveys
- ★ Recent Mom's Survey




Survey Women who Gave Birth in MN in May 2004

- ★ 1500 mom's surveyed who gave birth in May 2004
- ★ 72 % response rate
- ★ 37% reported having seen mom's guide
- ★ "Modeled" after WI mom's survey




Awareness Data


Survey	Time Period	Survey Population	Survey Type	Awareness
Creel Surveys	1989-1991	Anglers	in-person	60
DNR Angler Surveys	1998	MN residents	mail	56
DNR Angler Surveys	2005	MN residents	mail	43
WI/ME 12 State Survey	1999	Women of childbearing age	phone	25
Recent Mom's Survey	2004	Women who recently gave birth	mail	83



Different types of Awareness – Mom's Survey

- ★ 17% said they were NOT aware of issues with mercury in fish before survey (83% aware)
- ★ 37% reported having seen mom's guide
- ★ 63% were aware of issues with mercury before seeing brochure





What kinds and how much fish should I eat?
The following guidelines are for women of child-bearing age and children under 15 years of age.

Follow these guidelines when eating fish:

For fish caught in Minnesota lakes and rivers:

Amount of each type of fish caught in Minnesota		
<ul style="list-style-type: none"> Panfish (sunfish & crappie) Perch Bullheads 	<ul style="list-style-type: none"> Walleyes shorter than 20 in. Northern pike shorter than 30 in. All sizes of other species 	<ul style="list-style-type: none"> Walleyes longer than 20 in. Northern pike longer than 30 in. Muskie/Lunge
1 meal a week	1 meal a month	Do not eat.

For commercial fish (bought in a store or eaten in a restaurant):

Amount of each type of fish		
<ul style="list-style-type: none"> Salmon Cod Pollock Canned "light" tuna (6 oz.) 	<ul style="list-style-type: none"> Catfish Shrimp Trappie Herring Sardines Oysters 	<ul style="list-style-type: none"> Canned "white" tuna (6 oz.) Tuna steak Halibut Lobster
2 meals a week	2 meals a month	Do not eat.


Include all sources of fish you eat when making choices.
For example: If you eat over 6 oz. (one of whitefish) tuna, then wait two weeks before eating another meal of any type of fish. Or, if you eat one meal from an 18-oz. can of tuna, do not eat any other meals of fish for one month.

These fish are more likely to contain higher amounts of contaminants:

- larger fish
- older fish
- fish that feed on other fish (walleyes, northern pike, bass)
- fatty fish


Comprehension

- ★ WI/ME 12 state study of women of childbearing age
- ★ Recent Mom's Survey




Knowledge about mercury levels in fish

More Mercury in:	% All Respondents	% Respondents who saw MDH Mom's Guide	12 State Mercury Survey - All MN	12 State Mercury Survey - Aware MN
Older fish	40*	51*	50	60
Fish that eat other fish	24	32	15	18
Meat (vs fat, etc)	10	13	8	9




Behavior Change – Mom's Survey

After learning about mercury:	Percent all respondents	Percent respondents who saw MDH Mom's Guide
Ate less fish	28	35
Ate more fish	0	0
Ate different types of fish	13	20
Ate same amount of fish	29	35
Never ate fish	14	15





Communication Methods

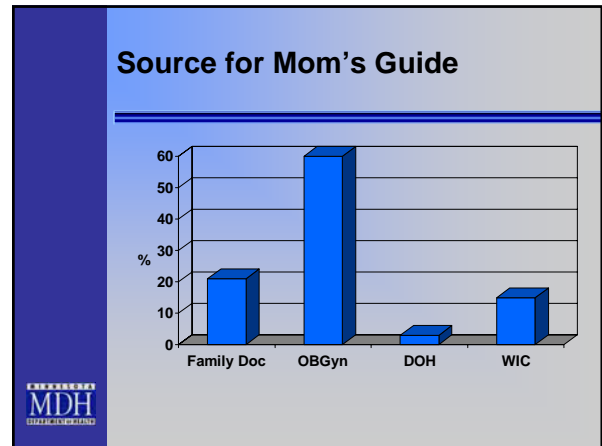
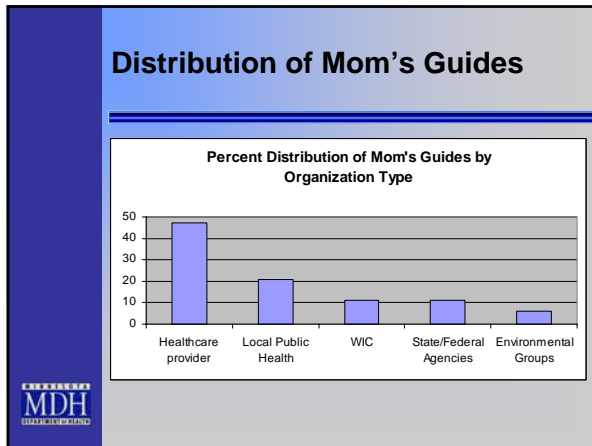
- ★ Annual production and distribution of outreach materials
 - Rely on Partners to Distribute
- ★ Web site
- ★ Annual Press Release – target news media to increase awareness
 - Newspaper, Radio, TV
- ★ Presentations by request



Targeted Distribution to Women

- ★ An Expectant Mother's Guide to Eating MN Fish brochure (English and Spanish)
- ★ WIC
- ★ Maternal Child Health
- ★ Local Public Health Agencies
- ★ Healthcare Providers
 - HMOs
 - Prenatal care




Maine’s Evaluation of Risk Communication Efforts

Eric Frohberg, Maine Center for Disease Control

Biosketch

Dr. Eric Frohberg (Ph.D.) is a Toxicologist with the Maine Environmental and Occupational Health Program. He has been involved in the development of fish consumption advisories and the Bureau’s Center for Disease Control’s Fish Advisory Communication Program. This work has included the development of new brochures, testing efforts with low-literacy focus groups, and surveys to evaluate the effectiveness of the risk communication program.


Maine's Evaluation of Risk Communication Efforts



Eric Frohberg
Maine Environmental and Occupational Health Program

Maine DHHS Public Health • Environmental and Occupational Health Program

Brochure Development and Evaluation



- "Easy to Read" brochure
- Target pregnant women
 - WIC, OB/GYN, FP/OB, CNM
- Targeted mailings to sport-fishing households.
- Baseline survey in 1999
- Evaluation survey in 2000, 2004
- Continuing inclusion in PRAMS 2004-

Maine DHHS Public Health • Environmental and Occupational Health Program

Comparison of Studies


	1998/9 Pre-Survey	2000 Post Survey	2004 Direct Mail	2004 PRAMS	2005 PRAMS
Target Pop	Women of Childbearing Age		Moms		
Sample Size	535	493	768	1165	1191
Mean Age	34 ± 7.5	34 ± 8.6	29 ± 5.7	28 ± 6.0	28 ± 5.9
Race (% white)	95%	96%	96%	96%	98%
Response Rate	64%		62%	74%	72%

Maine DHHS Public Health • Environmental and Occupational Health Program

Comparison of Studies

	2004 Moms	2004 PRAMS	2005 PRAMS
Target Pop	Moms		
Aware state has advice	60%		
Health Care Provider talk to you?		73%	77%
Health Care Provider give you a brochure?		67%	71%
Do you remember this brochure?	31%		

Maine DHHS Public Health • Environmental and Occupational Health Program



Recall

Com

with that 31%?

What You Need to Know About Mercury in Fish and Shellfish

Advice for Women Who Might Become Pregnant, Women Who are Pregnant, Nursing Mothers, Young Children

From the U.S. Food and Drug Administration, U.S. Environmental Protection Agency

Maine DHHS Public Health • Environmental and Occupational Health Program

Other measures of impact

◆ Canned tuna (the 6 ounce size) Limit: • For pregnant and nursing women, women who may get pregnant, and children under 8, 1 can of "white" or 2 cans of "light" tuna per week. No limits for all others as part of a balanced diet.

	Ate fish and got brochure	Ate fish and didn't get brochure	p value
Ate White Tuna	54% (48-60)	64% (59-68)	0.02
Ate Light Tuna	39% (33-46)	30% (25-35)	0.02

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Other measures of impact

	Got brochure	Didn't get brochure	p value
Eat any fish while pregnant	93% (90-96)	82% (79-85)	<0.01
Told Hg in fish bad for baby	97% (94-98)	86% (83-89)	<0.01
Told fish good for you	60% (54-66)	49% (45-53)	<0.01
Told fish good for baby	35% (30-41)	28% (24-32)	0.04


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Next Steps

Continued PRAMS

Evaluate change based on new brochure

Follow up print new moms direct mail survey



Maine DDES Public Health • Environmental and Occupational Health Program

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New Mothers' Nutritional Awareness Survey


Karen Knaebel, Vermont Department of Environmental Conservation

Biosketch

Ms. Karen Knaebel has served as the Mercury Education and Reduction Project Coordinator for the Vermont Department of Environmental Conservation (DEC) since 1998. Ms. Knaebel operates Vermont's Mercury Education and Reduction Program and oversees DEC's mercury product labeling program, including other regulatory aspects. She has organized many reduction and outreach efforts that have included a statewide fever thermometer exchange, lamp outreach program, and outreach to sensitive populations regarding fish consumption.

New Mothers' Nutritional Awareness Survey


Preliminary Survey Results
7/2/2007



Methodology

- Survey designed in collaboration by the Vermont Departments of Environmental Conservation (DEC) and Health (VDH).
- Feedback on the survey questions and methodology was provided by VDH's Survey Review Committee.
- Sample provided by the Vermont Department of Health from the Vital Records' Office (mother's place of residence).
- Completed surveys sent to DEC for data entry.
- Two full years of surveying is expected to be completed by 9/2007.

Results are preliminary and reflect data collected through June 2007. Data should not be released until final.



Advisory Awareness & Consumption Habits


- Survey parents of newborns (August 2005 -2007)
 - Random sampling based on location of residence within the state
 - 5,800 women surveyed – approx 40% overall response rate
 - Digital thermometer & brochure for responders
 - Name entered in quarterly drawing for \$50. gift certificate to store or pharmacy



HEALTH ALERT: The Vermont Department of Health recommends that people limit consumption of some fish caught in Vermont waters. 13.1%

44.7%


mercury in fish: Fish is good for you... eat fish low in mercury! 42.5%



Preliminary Results -- Summary

- There is very good awareness of the benefits to eating fish / shellfish (72% overall).
- The most common sources of information were newspaper or magazine articles, nurse or doctor, and family or friend. Most respondents learned about the benefits from more than one source.
- Only 42% of mothers were told or read about the benefits of eating fish for their baby. The most common source was a nurse or doctor.
- 95% of mothers had been told or read about mercury in fish being bad for their baby. The most common source was a nurse or doctor.
- 40% of mothers knew mercury could affect the baby up to age six.
- 56% of mothers weren't sure if the body can get rid of mercury over time.

Results are preliminary and reflect data collected through June 2007. Data should not be released until final.



Preliminary Results -- Summary

- Nearly two-thirds of mothers knew about the safe eating guidelines for fish. Less than half had seen one of the brochures, posters, or publications.
- 53% of women that knew about the safe eating guidelines chose to limit their intake of fish. An additional 23% stated they never eat fish.
- There was wide variation on knowledge of the safe eating guidelines based on county of residence.
- Mothers appear likely to eat more meals of canned tuna (1 – 2 meals) when they are aware that fish is good for their baby. 51% when aware versus 44% when not aware.
- Mothers appear likely to eat more meals of shellfish (1 – 2 meals) when they are aware that shellfish is good for their baby. 41% when aware versus 26% when not aware.

Results are preliminary and reflect data collected through June 2007. Data should not be released until final.

Questions / Comments ?

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Communicating the Indiana Fish Consumption Advisory

Charles R. Santerre, LaNetta Alexander, and Jim Stahl, Purdue University

Biosketch

Dr. Charles Santerre (Ph.D.) is a Professor of Food Toxicology in the Department of Foods and Nutrition at Purdue University. He previously served as an Operations Manager of Chemistry at Silliker Laboratories, Inc., an Adjunct Associate Professor in the Environmental Sciences Program at Ohio State University, and as an Assistant Professor in the Environmental Health Science Program and the Institute of Ecology at the University of Georgia. His research involves food toxicology and nutrition. He has conducted studies to examine the effects of cooking on xenobiotics and has developed rapid methods for measuring chemical contaminants. He was the National Spokesperson for the Institute of Food Technologists and has served as Chairperson for the Toxicology and Safety Evaluation Division and as the Director of the Food Toxicology Center of the National Alliance for Food Safety. He is currently a Scientific Advisor for the American Council on Science and Health, a Scientific Expert for the International Food Information Council, and a full member of the Society of Toxicology. He received a B.S. degree in Human Nutrition and his Ph.D. in Environmental Toxicology and Food Science from Michigan State University.

Communicating the Indiana Fish Consumption Advisory

Charles R. Santerre, Purdue University
LaNetta Alexander, IN State Department of Health
Jim Stahl, IN Department of Environmental Management

Indiana Advisory Issues - 1998

ISDH, IDNR, IDEM cooperate to collect and analyze sportfish for contaminants

- Only 10,000 copies of the Advisory printed annually (~60 page booklet)
- Advisory distributed to anglers (~80% male)
- Advisory was organized by waterbody
- Advice for sportfish and commercial fish were previously based upon different safety standards
- Nutritional information was not provided
- Advisory was only published in English

Fish Consumption Advisory Compliance

- ~38% of Indiana anglers don't follow advisory (Williams, O'Leary and Sheaffer, 1999)
- Potential impact – (634,780 or 10% IN pop.)
 - 5,876 - fetuses
 - 111,001 - 0 to <18 years of age
 - 517,780 - ≥18 yrs

(Santerre and Schaul, 2002)

Engagement

- Created web site <http://fn.cfs.purdue.edu/fish4health/>
- Organized advisories by 'county' and by 'waterbody'
- Reduced the page length for sensitive populations
- Provided the Advisory in Spanish and for Kosher consumers
- Combined Advice for Commercial and Recreationally-caught fish and applied EPA's safety limits
- Provided nutritional information for sensitive populations

Fish for Your Health™

[Advice for At Risk Consumers](#)
[Advice for At Risk Consumers in Spanish](#)
[Advice for At Risk Kosher Consumers](#)
[Group 5 Waterways](#)
[Advisory Groups](#)
[Health Topics](#)
[Cleaning Sportfish](#)
[Aquaculture vs. Wild Fish](#)
[Nutritional Content of Fish](#)
[IN Fish Consumption Advisory](#)
[Other State Fish Advisories](#)
[Fishes of Indiana](#)




 Contact Dr. Charles R. Santerre CSA@Purdue.edu

[Click Here for Spanish Version](#)

Impact

- Expanded Food & Nutrition Education Program (EFNEP)
- 721 low-income women (ages 18-49; 35% pregnant; 5% nursing) completed a pre-test and a post-test around a 30-50 minute one-on-one training
- 39% had not eaten fish in the past month
- 10% had eaten fish that is higher in mercury
- Only 7% had previously used the Indiana FCA
- 79% planned to use the FCA (after training)
- Participants learned the importance of: eating fish as part of a healthy diet; avoiding fish that are higher in pollutants; and selecting fish that are a good source of omega-3 fats

Why Eat Fish?

Pregnant or nursing women who eat fish that is high in omega-3 fatty acids will pass these nutrients to their babies and support healthy brain and eye development.

How Much Fish to Eat?

Health experts recommend that women eat 8 ounces per week (2 servings) and children (ages 2-4) eat 2 ounces per week. As a reference, 3 ounces of fish is about the size of a deck of cards.

Before Eating Fish That You Catch

Check with your State's Health Department for a local fish consumption advisory and avoid eating highly contaminated fish.

www.in.gov/ish/cfa/

Do Not Eat Raw Fish

When pregnant, avoid eating raw oysters, raw fish (sushi) or refrigerated smoked fish. Do not feed raw fish to young children.

Learn More

For more information please visit our website: fish4yourhealth.org

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Fish for your Health™



Advice for Pregnant or Nursing Women, Women that will become Pregnant & Young Children

High Mercury Never Eat	Moderate Mercury 4 ounces per week	Lowest Mercury 12 ounces per week	Best Choices Lowest in Mercury & Highest in Healthy Fats
swordfish shark king mackerel bluefish* tuna (fresh or frozen) grouper Spanish mackerel** Chilean sea bass golden snapper marlin walleye (Great Lakes) orange roughy	tuna (canned) halibut snapper bass (rainwater, black, striped) bluefish buffalo fish white croaker (Pacific) sea trout (weaifish) northern lobster salmon mahhi mahhi clark freshwater perch Spanish mackerel (S. Atlantic) tilapia (Atlantic)	shrimp salmon (wild or farmed) halibut cod crab clams flounder Rounder, plaice, sole scallops haddock rainbow trout (farm raised) herring mackerel (Atlantic, jack, chub) squid sardines wildfish ysters some lobster	salmon rainbow trout herring mackerel (Atlantic, jack, chub) sardines whitefish

*From Gulf of Mexico

Excessive mercury can pass through the placenta or mother's milk and harm your baby. Do not eat fish from the high mercury category. If you eat 4 ounces from the moderate group, don't eat any more fish until the next week.

Eating only 6 ounces per week of these fish provides the recommended amount of omega-3 fatty acids.

Distribution Targets

- Indiana State Department of Health
 - WIC Clinics
 - State Fair, Black Expo, County Fairs
 - County Public Health Offices
- County Cooperative Extension Offices
 - State Fair, County Fairs
- Media Outlets
- Ob/Gyn's, Pediatricians, RDs, Nurses
- Seafood Restaurants and Grocery Stores
- DNR's Recreation and Fishing Guide
- Fishing and Boating Shows

Validation

1. Should pregnant or nursing women eat fish?

yes no not sure

If you answered yes, why should a pregnant woman eat fish? (select all that apply)

great taste
healthy fats
healthy nutrients
low in saturated fats
affordable
other _____

If you answered yes, how much fish should a pregnant woman eat each week?

2 ounces 4 ounces 6 ounces 8 ounces 12 ounces I don't know

If you answered yes, how many meals of fish should a pregnant woman eat each week?

1 2 3 4 I don't know

If you answered no, please state your reason(s)? (select all that apply)

fishy taste
high risk from mercury
high risk from PCBs or other pollutants
high risk from pathogens
other _____

Validation

2. How many ounces are in a portion of cooked fish that is about the size of a deck of playing cards?

1 ounce 2 ounces 3 ounces 4 ounces 5 ounces I don't know

3. Should pregnant women, nursing women or young children eat fish that is caught from local rivers in Indiana?

yes, all caught fish is safe
no, some caught fish is unsafe
no, all caught fish is unsafe
not sure

If you answered "no, some caught fish is unsafe", how can you learn which caught fish are safe to eat?

4. Is it safe for pregnant women or young children to eat raw fish?

yes no not sure

5. Is all fish purchased from grocery stores or restaurants safe for pregnant women to eat?

yes no not sure

Validation

6. If you were pregnant and ate 4 ounces of halibut, would it be acceptable to eat 4 ounces of canned Albacore tuna in the same week?

yes no not sure

7. Can you list the names of any fish species that you might find in a grocery store or restaurant that is(are) not safe for pregnant or nursing women to eat (assume that the fish is fully cooked)?

8. Do all fish contain the same amounts of omega-3 fatty acids (healthy fats)?

yes no not sure

9. Can you list the names of any fish species that you might find in a grocery store or restaurant that is(are) higher in healthy fats (omega-3 fatty acids)?

Validation

10. From the information provided on the wallet card - if you were pregnant which would you be more likely to do:
decrease your overall fish consumption
increase your overall fish consumption
not change your overall consumption of fish
not sure
11. From the information provided on the wallet card - if you were pregnant which would you be more likely to do:
decrease your consumption of fish that is higher in mercury
increase your consumption of fish that is higher in mercury
not change your overall consumption of fish
not sure
12. From the information provided on the wallet card - if you were pregnant which would you be more likely to do:
decrease your consumption of fish that is higher in omega-3 fatty acids
increase your consumption of fish that is higher in omega-3 fatty acids
not change your overall consumption of fish
not sure
13. Was there any information that was not clear on the wallet card?

Questions and Answers

- Q. Has anyone tried to work with minority health groups or coalitions to figure out the best communication methods for minority outreach? (Alexander)*
- A. Vermont worked with the Refugee Resettlement Center to target different ethnic groups and attended large gatherings where they eat. Pictures really helped because the names of fish are often different than what the state refers to the fish species as. Vermont also talked to the tribes. (Knaebel)
- A. Only 4% to 5% of Maine is composed of minorities. This group is primarily American Indian tribes, Asians, and African Americans. The data that we have do not show significantly higher consumption rates of fish than the Caucasian groups. For Native Americans, this may be due to the severe contamination of rivers in the past century. (Frohmborg)
- A. Minnesota did not find that the different language brochures helped for southeastern Asian immigrants. Community-based interaction with presentations appeared to be more effective. Additionally, we have been helping tribes perform risk assessments and produce their own advisories. (McCann)
- A. In Wisconsin, WIC [Women, Infants, and Children] clinics serve a disproportionate size of minorities. We utilize the WIC for communicating with minorities. Additionally, our outreach for southeastern Asian groups parallels Minnesota's efforts. (Anderson)
- Q. What is the reason for the dichotomy between social and commercial interests? For instance, why is it legal to sell fish that contain high levels of mercury? Although it has huge implications for the distribution system, has anyone been working with distributors and wholesalers to find out if we can change the fish being sold? (Burger)*
- A. California is working with distributors who provide fish samples for analyses. It was clear that any fish over 200 pounds had high mercury levels. Why are we still allowing those fish to be sold here in the United States? Some of the walleye not allowed in Canada is being sold in the United States as well. We are currently exploring these questions and talking with seafood vendors. (Santerre)
- Q. Is FDA moving in a direction of helping consumers to make decisions in the supermarkets by labeling fish according to mercury levels? Washington state has adopted blue stickers on fish packages to ease the burden of choosing fish at the supermarket. (Kyle)*
- A. It is ideal to reach the public while they are in the store making fish choices; however, there are extensive policy issues surrounding this method. (Anderson)
- A. I am concerned about lack of fish consumption, which may be fueled by labeling fish in the markets. The problem with putting stickers on fish in a grocery store is that people take a fraction of a second to decide what to buy and we do not want to prevent fish consumption. Some stores are beginning to keep the brochures at the fish counter. Hopefully, we can gain some information regarding consumer reaction from these attempts. (Frohmborg)
- A. Until legislation requiring supermarkets to post information was pending, grocers did not allow Vermont to participate in the mailings and meetings regarding fish advisory posts in the grocery store. Whole Foods posted fish advice in the food stores and it increased fish sales. (Knaebel)
- A. Information next to a product is generally considered a label rather than informational or a recommendation. For this reason, it may be an FDA regulatory issue. (Santerre)

Q. If supermarkets had credible information that fish sales would improve with advisory postings, there might be a movement toward postings. How can agencies that have regulatory authority improve supermarket confidence that fish consumption advice in the stores would improve sales? (Lee)

A. The EPA/FDA report is meant to inform regulation and policy, not write policy. As a communication expert, I would like FDA to inform the public and supermarkets more effectively. The policymakers would be better able to answer this question. (Anderson)

Comment: Selenium binds mercury that would otherwise interfere with enzymes that keep the brain healthy. For example, swordfish can be used to prevent mercury toxicity. Mercury toxicity can be reversed by providing selenium. (Ralston)

Response: Our studies have not shown that selenium is effective in the prevention of mercury toxicity. (Weihe)

Comment: There is probably too much mercury present for selenium to be helpful. (Ralston)

Fish Advisories and Water Quality Standards: Tribal Perspectives

George Frantz, U.S. EPA

Biosketch

Mr. George Frantz was detailed to the position of Regional Indian Program Manager in January of 2006 and will continue at least until March 2008. The Indian Program works with the 10 federally recognized Tribes in New England on a government-to-government basis and provides assistance with grants, issues relating to the environment and public health, and technical issues. He is also responsible for providing consultation on important Tribal issues.

Before joining the Indian Program, Mr. Franz served as lead for EPA New England's Innovation & Experimental Projects Group, where he worked with Federal and State government representatives, industry, community, and environmental groups to design and implement innovative programs. The Experimental Projects Group has won numerous awards, including two Hammer Awards, an Innovations Pioneer Award, and an EPA Bronze Medal. Before joining EPA in September 1998, Mr. Franz served as Senior Program Manager for the Massachusetts Office of Technical Assistance (OTA). Before joining OTA, he worked in large and small environmental consulting firms, and he served as Director of Environmental and Safety Programs for Printing Industries of New England.

Mr. Franz received his B.S. degree in Foreign Service from Georgetown University School of Foreign Service, and he earned a M.S. degree in Civil and Environmental Engineering from Tufts University.

Abstract

Both the Penobscot Indian Nation and Aroostook Band of Micmacs have developed fish advisories for their Tribal populations because of contamination in fish tissue. The goal of the advisories is to reduce risk of illness to Tribal members caused by consuming unsafe quantities of contaminated fish. Such advisories can backfire. While Tribal nutritionists are advising members to consume less fatty foods and recommending fish because of their nutritional qualities, fish advisories can scare people away from a healthy food source because of a fear of mercury contamination from any fish. So the challenge is to create an educational program that conveys the right message (i.e., fish is a healthy source of protein, although certain fish, especially in quantity, should be avoided). The presentations of these two Tribes will shed light on the effort to manage this program in a way that produces health benefits and reduces risk for Tribal members.

* NOTE: Although this work was reviewed by EPA and approved for publication, it may not necessarily reflect official Agency policy.

Fish Advisories & Water Quality Standards... Tribal Perspectives

George Frantz
Indian Program Manager
EPA New England

Risk vs Benefit vs Culture

- Tribes in NE are coastal or riverine
- Ancient culture based on relationship with fish and wildlife species
- Culture equals *lifeways* not lifestyle
- State or Tribal fish advisories risk discouraging consumption

Advisories Based on Current Consumption

- States develop WQS based, in part, on current fish consumption patterns
 - General population
 - Anglers
 - Sustenance fishers (tribes)
- Concerns about contamination have suppressed tribal fish consumption
- Need work on historic consumption

Advisories & Water Quality Standards

- In 2006, MEDEP proposed new WQS
 - Previous consumption of 6.5 gm/day
 - New standard based on 32.5 gm/day
 - 5x over old standard; 2x EPA requirement
 - Clearly much more protective
 - EPA had published sustenance fishers guidance of 142.5 gm/day, tribes wanted state to use this
 - Current consumption est. ~ 22 gm/day

Questions and Answers

Q. How can we bring state and tribal folks closer together? (Frohberg)

A. In Maine, the communication is very good, although there is always room for improvement.

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Aroostook Band of Micmacs: Fish Consumption Advisory Issues

Fred Corey, Aroostook Band of Micmacs

Biosketch

Mr. Fred Corey, who is Director of the Environmental Department for the Aroostook Band of Micmacs Indian Tribe in northern Maine, is responsible for the development and management of all Tribal environmental programs. Mr. Corey also serves as Laboratory Director for Micmac Environmental Laboratory, an EPA and State of Maine Certified Drinking Water Laboratory owned and operated by the Aroostook Band of Micmacs. Mr. Corey's professional interests include environmental chemistry and Tribal risk assessment.

Abstract

The Aroostook Band of Micmacs and the State of Maine have implemented statewide fish consumption advisories due to the presence of chemical contaminants in fish tissue. As a result of the changes to Tribal lifestyles and diets caused by these contaminants and the general depletion of Maine's natural resources, the incidence of diabetes, obesity, cardiovascular disease, and other related diseases has skyrocketed in the Micmac Tribal community. The Aroostook Band of Micmacs' health program is working to counter these health problems by counseling the Tribal community to avoid fatty foods; consume leaner sources of protein, such as fish; and to exercise regularly; however, this message is being compromised by the existing fish consumption advisories.

To avoid sending mixed messages about the risks and benefits of consuming fish, environmental and public health experts must coordinate their efforts to ensure effective risk communication to the public. In addition, the associated benefits of fishing and consuming fish, such as the exercise opportunities afforded by fishing, the family activity benefits, and the importance of maintaining and practicing ancient Tribal cultural practices associated with fishing, must all be considered when evaluating and communicating risk to the public.

Aroostook Band of Micmacs Fish Consumption Advisory Issues



Fred Corey
Environmental Director
Aroostook Band of Micmacs
Presque Isle, Maine

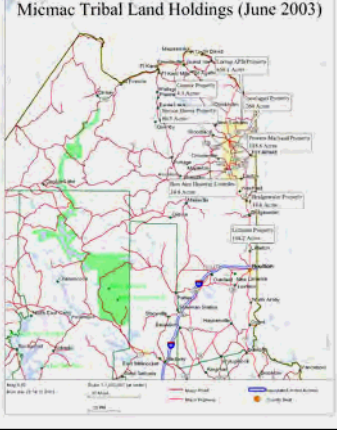
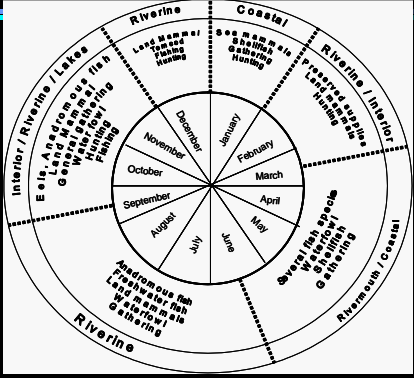
Introduction

- About the Aroostook Band of Micmacs
- Fish Consumption Advisory
- Local Availability of Fish
- Health Statistics
- Rethinking the Advisory

Aroostook Band of Micmacs

- Federally Recognized by Congress in 1991
- 1,000 Enrolled Members
- Largest Maritime Tribe in Eastern Canada (50,000+ Members, 27 Reserves)
- Current land holdings include approx 1,300 acres property in Aroostook County

Micmac Tribal Land Holdings (June 2003)

A Micmac Seasonal Round (Burley)

Safe Eating Guidelines

Freshwater Fish

- Pregnant and nursing women, women who may get pregnant, and children under age 8 SHOULD NOT EAT any freshwater fish from Maine's inland waters. Except, for brook trout and landlocked salmon, 1 meal per month is safe.
- All other adults and children older than age 8 CAN EAT 2 fish meals per month. For brook trout and landlocked salmon, the limit is 2 meals per week.

Saltwater Fish and Lobster

- Striped Bass and Bluefish: Eat no more than 2 meals per month.
- Shark, Seafood, Mackerel, and Tilefish: Pregnant and nursing women, women who may get pregnant and children under age 8 are advised to NOT EAT any of these fish. All other individuals should eat no more than 2 meals per month.
- Cannard Tuna: Pregnant and nursing women, women who may get pregnant and children under age 8 should eat no more than 1 can of "white" tuna or 2 cans of "light" tuna per week.
- All other ocean fish and shell fish, including lobster, eat no more than 2 meals per week.
- Lobster Tomalley: NO CONSUMPTION.

State and Local Contacts

For more information or current health advisories, contact the following:

Maine Environmental Health Dept.
8 Northern Road
Presque Isle, Maine 04769
764-7219 ext.118 or out of area
1-800-750-1372

Maine Bureau of Health, Environmental Toxology Program
1-866-292-3474 or
janus.state.me.us/dhs/tology/index.html

U.S. Environmental Protection Agency, Office of Water
Fish Contamination Program (4305)
401 M Street, SW
Washington, DC 20460 or
www.epa.gov/ost/fishadvice

Keeping Our Traditions and Our Families Alive



For many years our people have fished the waters of Maine. Unfortunately, these waters are being poisoned and precautions should be taken when eating the fish you catch.

Is The Fish I'm Feeding My Family Safe?

Fishing is a tradition many Native Americans still preserve and practice. Fish are an important part of a healthy diet. They are a lean, low-calorie source of protein. To our ancestors, fishing was necessary to feed their families. However, today's lakes, rivers, and oceans contain chemicals that could pose health risks if these fish are eaten in large amounts. It's hard to believe fish that look, smell, and taste fine may not be safe to eat. Keep your family and traditions alive by following the [Safe Eating Guidelines](#) and these three easy steps.



Step #1
Call Your Local or State Environmental Health Department.
 Your favorite fishing hole may have high levels of chemical pollutants. Contact your local or state environmental health departments to see if any health advisories are posted in areas you fish. (see back panel for contact information)

Step #2
Select Certain Kinds and Sizes of Fish for Eating.
 If you eat game fish, such as lake trout, salmon, and bass, eat smaller, younger fish. They are less likely to contain harmful levels of pollutants than larger, older fish. Eat top feeders, such as perch, brook trout and smelt, instead of bottom feeders like catfish and carp. They feed on insects and are less likely to contain high levels of harmful chemicals.



Step #3.
Clean and Cook your Fish Properly.
 It is a good idea to remove the skin, fat, and internal organs as soon as possible. Follow proper food handling and storage techniques to prevent the growth of bacteria and viruses. The way you cook fish can make a difference in the kinds and amounts of chemical pollutants remaining in the fish. Grill, bake, or broil your fish so fat possibly containing pollutants can drain away. Eat less deep-fried fish because frying seals in any chemicals that may be present in that fish. Lastly, if you like smoked fish, remember to fillet the fish and remove the skin before smoking.



Current Consumption Limits for Aroostook Fish

- Pregnant/Nursing Women and Children
1 meal trout/salmon per month
- Everyone Else
1 meal trout/salmon per week

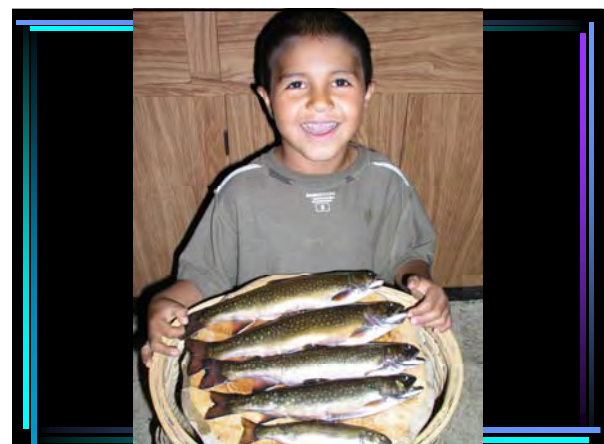
Health Risk Factors (Tribal pop 530)

	Tribal	Maine
Overweight/Obese	64.5 %	56.3 %
Diabetes Indicators	11.5 %	7.5 %
Hypertension	42.0 %	25.6 %

- ### Benefits Not Realized by Advisory
- Associated health benefits (exercise)
 - Family strengthening (collecting bait, fishing, cleaning, cooking, eating)
 - Cultural practices associated with fishing (stories, songs, prayers)
 - Language

Rethinking the Advisory

- Do the benefits of fishing and consuming fish outweigh the risks?



For additional information contact:

Fred Corey
Environmental Director
Aroostook Band of Micmacs
8 Northern Road
Presque Isle, Maine 04769

(207) 764-7765

fcorey@micmac-nsn.gov

Developing and Communicating Fish Consumption Guidelines for Penobscot Nation Territory Waters

Dan Kusnierz, Penobscot Nation

Biosketch

Mr. Daniel Kusnierz obtained a B.S. degree in Wildlife Biology in 1989 from the University of Vermont and an M.S. in Wildlife Management at the University of Maine, Orono, ME. He has served as the Manager of the Penobscot Indian Nation's Water Resources Program since January 1993. In this capacity, Mr. Kusnierz oversees many water resource-related projects conducted by the Tribe, including a watershed-wide water quality monitoring program; studies of contaminant levels in fish, aquatic wildlife, and sediments; assessments of water quality using aquatic invertebrates; and studies of cumulative impacts. The program also participates in many permitting, licensing, and regulatory proceedings that affect the Penobscot Reservation and its aquatic resources. Mr. Kusnierz works with the Penobscot Nation Health Department to jointly establish fish consumption advisories for Tribal waters. He also serves as the Tribal Coordinator for the model water quality monitoring cooperative agreement between the Penobscot Nation and the Maine Department of Environmental Protection.

Mr. Kusnierz has served on many committees, including the Technical Advisory Committee for Maine's Surface Waters Ambient Toxics Program and the Maine Dioxin Monitoring Program and the Maine Council on Environmental Monitoring and Assessment. He also participates on EPA's Regional Tribal Operations Committee. Mr. Kusnierz is the Region I Tribal representative to EPA's National Tribal Science Council and the National Tribal Water Council.

Abstract

As a riverine Tribe, whose unique reservation consists of the islands and waters of the Penobscot River upstream of Indian Island, the Penobscot Indian Nation (PIN) has historically and continues to rely upon fish and other wild foods from these waters. The importance of these foods to the culture, health and well being, and identity of the Tribe is demonstrated by the existence of the Tribe's treaty-reserved sustenance fishing rights.

Since the initial discovery of dioxin in fish from the Penobscot River in 1987, the PIN Water Resources Program has been involved with efforts to monitor toxic contaminants in fish and other wild foods used by Tribal members and to communicate risks associated with consuming these foods.


The Tribe initially relied upon advisories established and posted by the Maine Bureau of Health. As new information became available from Tribal and other sources, the PIN Water Resources Program collaborated with the PIN Health Department to develop our health advisories for Tribal territory waters. These advisories, and the way in which they have been communicated, have been modified over time to be more understandable to the Tribal community. We also worked with the PIN Health Department to educate health care providers about the risks of consuming contaminated foods.

This presentation also discusses some of the challenges we have encountered while protecting the health and culture of Tribal members, including confusion caused by advisories from different agencies, balancing the protection of health versus the continuation of cultural practices, and health-based water quality limits that do not protect Tribal uses.



Developing and Communicating Fish Consumption Guidelines

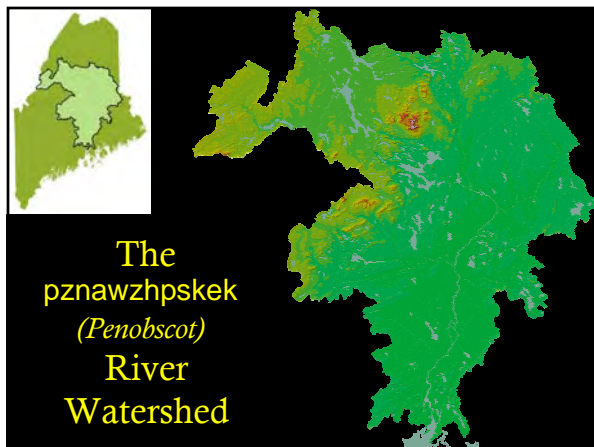
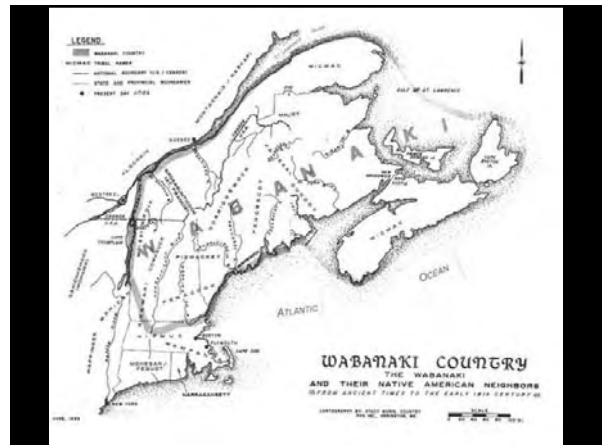
For Penobscot Nation Territory Waters



Daniel Kusnierz,
Water Resources Program Manager
Penobscot Nation DNR

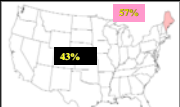
Daniel Kusnierz
Penobscot Indian Nation


12 Wabanaki Way, Indian Island, ME 04468
(207)817-7361
pinwater@penobscotnation.org



Residency

- >2200 Tribal members
- 22% on the reservation, Indian Island
- 57% in Maine



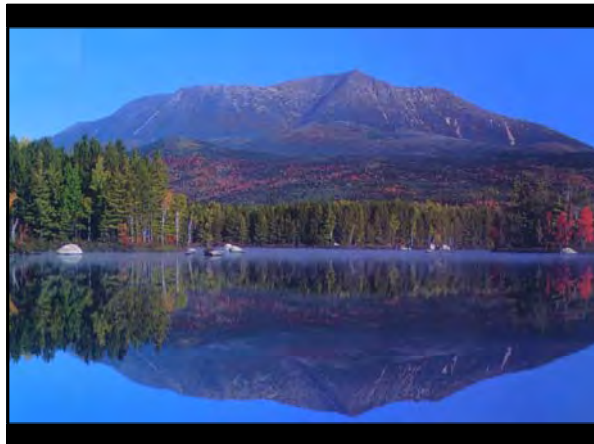
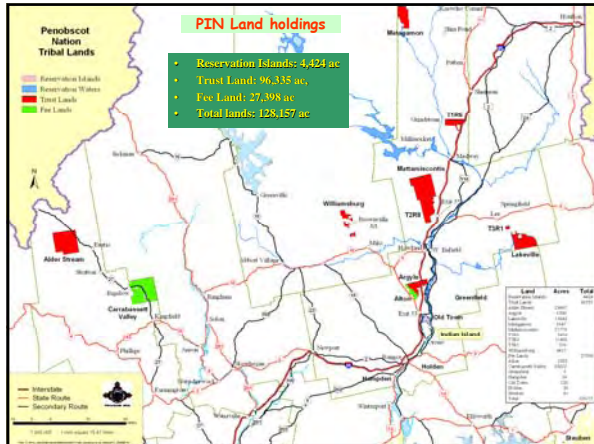


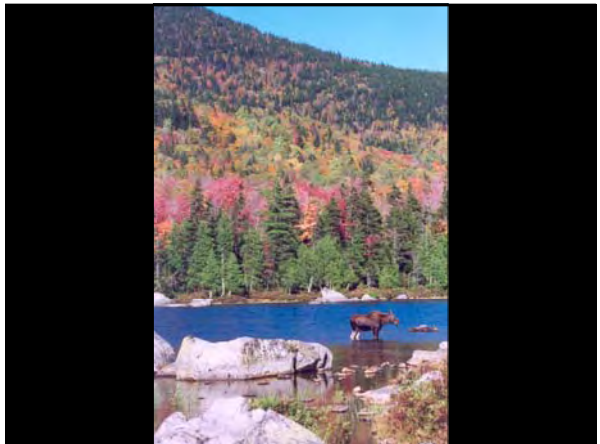
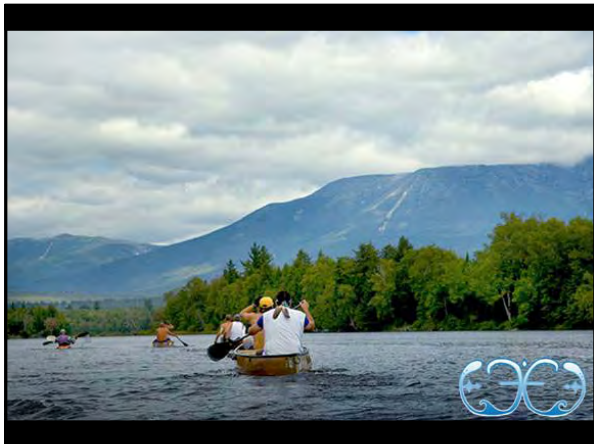
22%

75% @ 50mi

57%

43%





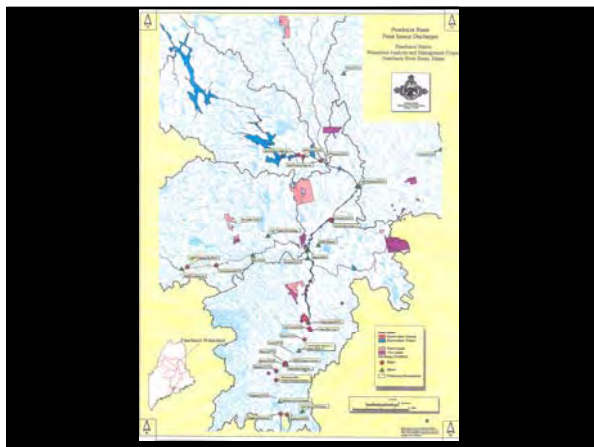
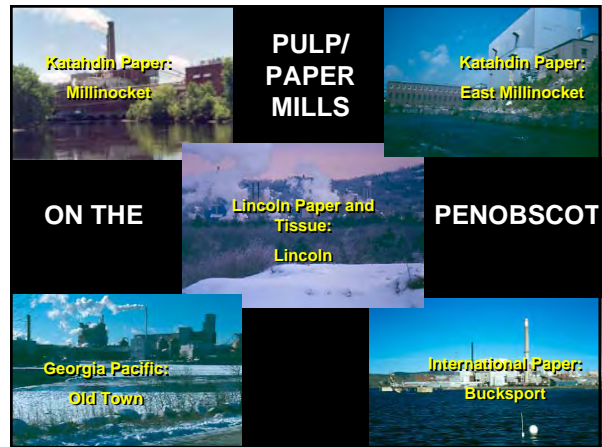
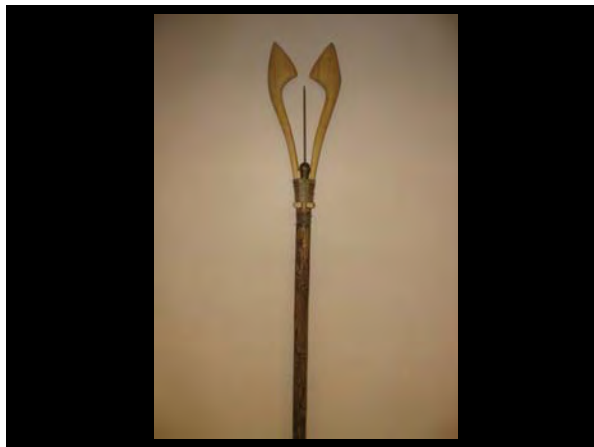




1980 Maine Indian Claims Settlement Act

- Defined Reservation/Extinguished Other Land Claims for Penobscot and Passamaquoddy
- Re-affirmed Sustenance Fishing Rights Reserved in Historical Treaties
- Formed MITSC to Address Jurisdictional and Co-management Issues
- Provided funding and Guidelines for Acquiring Trust Lands





TOXICS RELATED WORK

Primarily focuses on species of importance to tribe

- Fish
 - Penobscot River
 - Trust Land Waters
- Muskrat
- Turtles
- Fiddlehead-Ostrich fern
- Freshwater mussels
- Sediments (pathway/reservoir)
- Duck
- Loons
- Eagles



TOXICS RELATED WORK

Contaminants Examined Include:

- Dioxins – 2378 substituted isomers
- Furans – 2378 substituted isomers
- PCBs – particularly coplanar types
- Heavy metals – including Hg, Pb, As, Se, Cd, Cu, Zn
- Chlorinated phenols

Chronology of Fish Advisories on Penobscot River and PIN lands

Date	Event	Findings
1985-86	EPA National Bioaccumulation Study (available 1987)	-Dioxin (TCDD) first discovered in the Penobscot. [TCDD/DF] in bass from S. Lincoln averaged 5.0 ppt. (fillets)
July 1987	DHS (w/ ME DEP and DIFW) Health Advisory	-First fish consumption advisory on Penobscot River
1988	Maine Dioxin Monitoring Program (38 MRSA Sec.420-A)	-Enacted by legislature to sample fish tissue below known or suspected sources.
1988	EPA's 104 Mill Study	-[TCDD] in LP&P wastewater is 32 ppt.
1988-90	Penobscot Nation Fish Tissue Study and ME Dioxin Monitoring Program	-Sampled bass and suckers at 6 stations (3 above, 3 below Lincoln); also Piscataquis River bass. [TCDD/DF] ND at control sites; significantly > at downstream sites. Sucker levels highest of any fish in Maine.
1992	ME DHS Health Advisories	-State updates advisories -Advisory issued for eating tomalley from lobsters. -PIN posts state advisories
1994	ME DHS issues Hg advisory	Statewide advisory for Hg for freshwater fish
1995?	ME SWAT monitoring program begins	State advisories updated to include PCBs
1995	PIN DNR Hg testing of Trust Land lakes begins	-[Hg] in several ponds and species of concern
1996	PIN DNR and PINHD Advisory	-First tribal consumption advisory issued

Why did we set our own fish consumption advisories?

- To be protective of tribal member health
- Tribal waters specific data
- To minimize confusion of other advisories
- Trust from Tribal Community



Setting PIN Tribal Consumption Advisories

- Data sets used:
 - Primarily PIN Territory Waters specific data collected from PIN contaminant studies.
 - Some additional data from studies on PIN waters by other entities (EPA EMAP, GNP and BHE hydro relicensing)
 - Supplemented by ME DEP data from nearby waters for species not collected by PIN.
 - Species sampled: white perch, smallmouth bass, brook trout, chain pickerel

Setting PIN Tribal Consumption Advisories

- We primarily relied upon EPA Guidance (consumption limit tables) to establish consumption limits for Hg (2nd edition)
- Utilized ME DHS limits for TCDD and PCBs

MERCURY LEVELS IN FISH FROM TRUST LANDS AND PONDS
By Dan Kusnierz, Water Resources Manager

The Department of Environmental and Natural Resources conducted monitoring of seven species of fish collected from several Trust Land lakes and ponds. Mercury is a chemical that does cause health effects and toxic effects of the kidney and nervous system. The study shows that levels are similar to those of lakes and ponds throughout the state. In general, larger fish contain higher levels of mercury than smaller, younger fish of the same species. Eating smaller fish often that eat other fish contain more mercury than species that eat insects and other non-fish foods. Therefore, it is advisable that people avoid or limit eating larger fish from these waters. Below are specific guidelines that should be read when eating fish from the following waters:

East Branch Lake, Matamiscontis Lake

- **Smallmouth bass caught from East Branch Lake should not be eaten by anyone.**
- **Other non-predators will often bring fish that are at least 12 inches long. These fish often have contained high levels of mercury. DNR will place a control netting on nearby lakes in the next season to determine whether changing the control net will reduce the amount of mercury in fish.**
- **When people catch and eat fish from East Branch Lake and Matamiscontis Lake, they should eat 4 ounces of prepared walleye, muskellunge, or smallmouth bass 1-2 times per week.**
- **Other people should limit eating walleye, muskellunge, or smallmouth bass to 2-3 meals each month. People who eat larger fish (other than 12" or longer) should eat 1 meal per month. People who eat larger fish (other than 12" or longer) should eat 1 meal per month. The amount of fish should be 4 oz. portion. People should eat three meals of fish per month. People should eat three meals of fish per month. People should eat three meals of fish per month.**

East Mountain Pond, Matamiscontis Pond

- **Smallmouth bass caught from East Mountain Pond had significantly lower amounts of mercury than other fish species from other waters. Although the levels were lower than fish to be eaten by certain people, other fish still should have these consumption.**
- **When people catch and eat fish from East Mountain Pond and Matamiscontis Pond, they should eat 4 ounces of prepared walleye, muskellunge, or smallmouth bass 1-2 times per week.**
- **Other people should limit eating walleye, muskellunge, or smallmouth bass to 2-3 meals each month. People who eat larger fish (other than 12" or longer) should eat 1 meal per month. People who eat larger fish (other than 12" or longer) should eat 1 meal per month. The amount of fish should be 4 oz. portion. People should eat three meals of fish per month. People should eat three meals of fish per month.**

Blackhead Pond

- **No fishing was done on Blackhead Pond from Blackhead Pond. However, because there are no special mercury levels should be lower than those in water from Blackhead and Matamiscontis Catches Pond. Therefore, people who eat fish from Blackhead Pond should be categorized as people who eat fish from Blackhead and Matamiscontis Catches Pond.**

Small Lake, Matamiscontis

- **No fishing was done on fish from Small Lake Matamiscontis. However, because there are no special mercury levels should be lower than those in water from Blackhead and Matamiscontis Catches Pond. Therefore, people who eat fish from Small Lake should be categorized as people who eat fish from Blackhead and Matamiscontis Catches Pond.**
- **All species of fish from Small Lake Matamiscontis should not be eaten by children less than 12 years old, pregnant women, nursing mothers, or women of childbearing age.**
- **Other people should limit eating large lake fish.**
- **When eating smaller species, track size and when people should follow the State-wide advisory which recommends limiting consumption to 1-2 fish meals per year. People who eat larger fish should eat the lower limit of a meal. People who eat smaller fish should eat the upper limit of a meal.**

Lake and Ponds

There are small levels of mercury in water from these waters. However, because of the way mercury is taken up by fish, it can be a problem. Fish from these waters contain mercury, which can be a problem. Fish from these waters contain mercury, which can be a problem. Fish from these waters contain mercury, which can be a problem.

The Penobscot River

There are problems with dioxin, mercury, and PCBs in fish from the Penobscot River. There are problems with dioxin, mercury, and PCBs in fish from the Penobscot River. There are problems with dioxin, mercury, and PCBs in fish from the Penobscot River.

Safe choices

- **Children under 12 years old should not eat fish from these waters.**
- **Women who are pregnant, nursing, or could become pregnant should not eat fish from these waters.**
- **All others should eat no more than 1 meal per month of fish from these waters.**

Going Fishing?

Know which fish are safe for you to eat

Lakes and Ponds

The Penobscot River

Safe choices

- **Children under 12 years old should not eat fish from these waters.**
- **Women who are pregnant, nursing, or could become pregnant should not eat fish from these waters.**
- **All others should eat no more than 1 meal per month of fish from these waters.**

Observe Mercury Advisory

Unsafe levels of mercury have been found in large bass at Mattamiscontis Tribal Trust Lands.

No one should eat bass from East Branch Lake that are over 20 inches long.

Until further testing, women of child bearing age and children should eat no fish from Maine lakes or ponds. Contact Penobscot Nation Department of Natural Resources for more detailed fish consumption guidelines for lakes at the Mattamiscontis Tribal Trust Lands and other tribal waters.

Penobscot Nation Department of Natural Resources
6 River Road, Indian Island, ME 04868
207-227-7776

Revised 12/09 - T.E.C.

WARNING!

GUIDELINES FOR EATING FISH FROM PENOBSCOT TERRITORY WATERS

To prevent possible harm from mercury, dioxin, and PCBs due to eating freshwater fish, we offer this advice:

- **All children under 12 and women who are nursing, pregnant or could become pregnant should eat NO FISH from Penobscot Nation Territory waters and other Maine inland waters.**
- **Everyone else should eat no more than 1 meal per month of fish from these waters.**

Everyone else:

- **From Penobscot River below Mattamiscontis Falls (Down):**
 - **Should eat no more than 1 meal per month.**
- **From Penobscot River below Mattamiscontis Falls (Up):**
 - **Should eat no more than 1 meal per month.**

Small trout and salmon are safer choices than large bass and pickerel.

Penobscot Nation Health Department and Department of Natural Resources feel that we do not have enough data on the health effects of these contaminants to recommend dioxin and PCBs. That is why we are making precautionary recommendations to protect our community. If you plan to fish for recreation, please use the State of Maine Open Water Fishing Regulation booklet for consumption guidelines.

For questions or more information:
Penobscot DNR 207-227-7776 x-7761

Warning!

Guidelines for eating fish from Penobscot Territory Waters

To prevent possible harm from mercury, dioxin, and PCBs due to eating freshwater fish, we offer this advice:

All children under 12 and women who are nursing, pregnant or could become pregnant, should eat **NO FISH** from Penobscot Nation Territory waters and other Maine inland waters.

EVERYONE ELSE who is taking fish from Penobscot Nation Territory waters:

on the Penobscot River below Mattamiscontis Falls (Downstream) OR anywhere else where you are fishing:

- **You should eat NO FISH from these waters.**
- **You should eat NO FISH from these waters.**
- **You should eat NO FISH from these waters.**
- **You should eat NO FISH from these waters.**

Warning!

Guidelines for eating fish from Penobscot Territory Waters

To prevent possible harm from mercury, dioxin, and PCBs due to eating freshwater fish, we offer this advice:

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on the Penobscot River below Mattamiscontis Falls (Downstream) OR anywhere else where you are fishing:

- **You should eat NO FISH from these waters.**
- **You should eat NO FISH from these waters.**
- **You should eat NO FISH from these waters.**
- **You should eat NO FISH from these waters.**

How Do We Get The Message Out?

- Posting access points of waters
- Postings and brochures at DNR Office where licenses obtained
- DNR Newsletter (mailed to community members)
- Workshops/presentations
- Direct one-one communication
- Health Department
 - EJ project to educate health care providers on hazards of consuming contaminated fish
 - Prenatal consults
 - HD newsletter (including store bought fish)
- Web page

WATER RESOURCE PROGRAM
Protecting the Penobscot given to the Nation by the Creator for living, subsistence, and spirit

- The Watershed
- Who We Are
- What We Do
- Dischargers
- Dams
- Water Classification
- Partnerships
- Resources
- DNR Newsletter

Fish Advisory

FISH CONSUMPTION ADVISORY

Warning!
Guidelines for eating fish from Penobscot Territory Waters to prevent possible harm from mercury, dioxins, and PCBs due to eating freshwater fish, we offer this advice:

All children under 8 and women who are nursing, pregnant or could become pregnant, the most sensitive population from health effects of mercury, should eat NO FISH from Penobscot Nation Territory waters and other Maine inland waters.

For the remainder of the population, we offer this advice:

- Small fish:** You should eat NO more than 1 meal per month.
- Large fish:** You should eat NO more than 2 meals per month.

Do not consume fish from Mattawamkeag Dam (Mattawamkeag) on the Penobscot River below Mattawamkeag Dam (Mattawamkeag).

Warning!
Guidelines for eating fish from Penobscot Territory Waters

To prevent possible harm from mercury, dioxins, and PCBs due to eating freshwater fish, we offer this advice:

All children under 8 and women who are nursing, pregnant or could become pregnant, **the most sensitive population from health effects of mercury,** should eat **NO FISH** from Penobscot Nation Territory waters and other Maine inland waters.

If you are eating fish, small trout and salmon are safer choices than large bass and pickerel.

EVERYONE ELSE who is taking fish from Penobscot Nation Territory Waters

on the Penobscot River below Mattawamkeag Dam (Mattawamkeag)

You should eat **NO more than 1 meal per month.**

This advisory is for protection from dioxins and PCBs.

EVERYONE ELSE who is taking fish from Penobscot Nation Territory Waters

OR anywhere else, where you are taking...

- ... Brook trout, Landlocked salmon
- OR Any other fish

You should eat **NO more than 1 meal per week.**

You should eat **NO more than 2 meals per month.**

These advisories are for protection from mercury.

Risk Communication to Decision Makers

- Advisories are not the endpoint/answer
- Some tribal members will ignore advisories
- Loss of tribal fishing rights and culture will continue if:
 - WQS and permits based on suppressed consumption
 - Tribes are not consulted with

Risk Communication to Decision Makers

- WQS and permit limits need to be base on what consumption levels should be in order to allow tribal traditional practices!



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2006 Food Safety Survey: Analysis of Seafood Questions (EPA/FDA)

Steve Bradbard, Food and Drug Administration

Biosketch

Dr. Steven Bradbard (Ph.D.) supervises a multidisciplinary consumer studies staff at the FDA's Center for Food Safety and Applied Nutrition (CFSAN). His team of eight social scientists conducts consumer surveys, experiments, focus groups, and other communications research to support government regulations and policy related to food safety and applied nutrition. Dr. Bradbard completed his undergraduate and graduate training in Psychology at the University of Maryland. Prior to joining CFSAN in 2001, Dr. Bradbard served as Research Director for a private firm in Washington, D.C., where he specialized in risk communication and social marketing campaigns for federal agencies. He helped develop research-based health and safety campaigns for the National Institutes of Health, EPA, and the U.S. Department of Transportation. Dr. Bradbard served as the co-investigator for the focus groups that were conducted in 2003–2004 to inform the format and content for the 2004 joint FDA–EPA methylmercury advisory. He is also a member of the research team that is currently evaluating consumer awareness and understanding of the Mississippi Delta advisory.



Abstract

In 2004, FDA and EPA released a joint advisory addressing methylmercury in seafood. The advisory provided pregnant women, nursing mothers, women of child-bearing age, and caregivers for young children with recommendations for consumption of commercial and wild-caught fish. FDA and EPA were concerned that there might be audience “spillover” following the announcement of the advisory; that persons outside of the target audiences might change their seafood consumption following this new advice. The 2006 Food Safety Survey, a random digit-dial telephone survey with a sample size of approximately 4,000 adults, included questions about their awareness of methylmercury as a food safety problem and their beliefs and concerns about eating fish. A separate analysis was performed for the sub-sample women of childbearing age, 18–45 years old. More than 80% of both samples reported eating seafood in the past year. The majority of both groups had heard about health benefits associated with eating fish, as well as health concerns associated with seafood. Of those who had heard of benefits and/or concerns, 12% identified themselves as eating more seafood and 12% said they eat less. Of those who were aware of health concerns, more than 70% of both groups had heard of methylmercury as a problem in some seafood. Also, one-third of those who had heard of methylmercury said it was a problem for pregnant women or women who might become pregnant.

Seafood Questions from the 2006 FDA Food Safety Survey



FDA Center for Food Safety and Applied Nutrition

EPA Fish Forum
July 27, 2007





Background

- 2003-2004 FDA/EPA Focus Groups
 - Develop concise and understandable consumption advice.
- 2004 Joint Advisory
 - Concerns about actual message conveyance, knowledge utilization, and possible message “spillover.”





Objectives

- Survey American adults and women of childbearing age (18-45 years) to determine:
 - Awareness of health benefits and concerns from eating seafood,
 - Awareness of mercury as a problem in seafood,
 - Knowledge of the kinds of seafood that are a problem, and
 - Knowledge of subgroups who are advised to limit seafood with higher levels of mercury.





2006 Food Safety Survey

- Random digit dial telephone survey with more than 4600 American adults, including 1256 women 18-45 years old.
- Nationally representative sample.
- Results can be used to provide population estimates.
- For 2006, we collaborated with EPA to add seafood questions to the survey.





Reported consumption

- 84% of adults have eaten some seafood in the past year.
- 83% of women 18-45 years report eating seafood in the past year.
- 20% of adults say have eaten recreationally caught fish in the past year.
- Only 15% of women say they have eaten this type of fish.



Health benefits and concerns



- 71% of adults have heard of health benefits from eating seafood. 62% have heard of health concerns.
- 68% of women 18-45 years have heard of health benefits. 59% have heard of concerns.



Changes in eating seafood

- Of those adults who have heard of health benefits and/or concerns:
 - 12% now eat more seafood
 - 64% eat the same amount of seafood.
 - 12% eat less seafood*
 - 12% eat more of some types of seafood and less of other types

* 71% of those who eat less seafood eat less of specific types

Changes in eating seafood



- Of those women 18-45 years who have heard of health benefits or concerns:
 - 16% now eat more seafood
 - 59% eat the same amount of seafood.
 - 13% eat less seafood*
 - 13% eat more of some types of seafood and less of other types

* 73% of those who eat less seafood eat less of specific types






Consumption by aware respondents

Aware of benefits/ concerns	Eat more	Eat the same	Eat less	Eat more or less of some
Adults	12%	64%	12%	12%
Women 18-45 years	16%	59%	13%	13%



Awareness of mercury as a problem

- 77% of adults had heard about mercury as a problem in some seafood. 71% of women 18-45 years had heard about this.
- They were then asked an open-ended question requiring them to state the kinds of seafood for which mercury is a problem.



Most often mentioned seafood

	Adults	Women 18-45
Any mention of tuna	18.6%	20.7%
Recreationally caught fish	8.6%	5.9%
Any mention of salmon	8.5%	7.2%
Swordfish	7.9%	7.8%
Raw shellfish	7.7%	8.3%



Other seafood mentioned

	Adults	Women 18-45
Canned tuna	4.0%	4.7%
Albacore or chunk white tuna	1.3%	1.4%
Farm raised salmon	3.3%	3.1%
King mackerel	1.4%	1.6%
Shark	3.2%	3.8%

Targets for the advisory

- Those who had heard about mercury as a problem in fish were asked (unaided) if they had heard of any groups who are advised to be careful not to eat too much seafood higher in mercury.
- 19.3% of adults had not heard of a particular group.
- 14.8% of women 18-45 years also had not heard of a particular group



Target groups for advice

	Adults	Women 18-45
Pregnant/might become pregnant	19.3%	43.2%
Nursing mothers	0.9%	1.7%
Young children	15.2%	17.1%
No particular group	23.8%	19.2%
Don't know	7.3%	7.1%






Summary of findings

- The large majority of adults and women of childbearing age are aware of both health benefits and concerns from eating seafood.
- The majority of these “aware” adults continue to eat the same amount of seafood.
- While some have decreased their consumption, an equal percentage of adults say they eat more seafood.
- For women 18-45 years, the percentage eating more is slightly greater than that for those eating less.



Summary of findings

- While the large majority of adults and women 18-45 years have heard about mercury as a problem in some seafood, they have difficulty naming the seafood that present a concern.
- Also, less than half of all adults and women 18-45 years spontaneously said that mercury advice is targeted to pregnant women or women who may become pregnant.

Additional Research

- We have completed data collection from the Infant Feeding Practices Study II. This mail survey includes questions assessing pregnant women’s awareness of the advisory and beliefs/concerns about eating fish.
- We will soon conduct a survey of OB-GYNs, physician assistants and nurse practitioners, nurse midwives, and WIC educators.

Questions and Answers

- Q. You mentioned that many individuals weren't aware of tilefish. Did the survey distinguish between king mackerel and Atlantic mackerel? We are concerned that the general public does not know the difference between king mackerel and won't eat Atlantic mackerel. (Frohmborg)*
- A. I don't believe the codes were designed for surveyors to distinguish between the two.
- Q. According to the national data, people were not discouraged from eating fish and, many people knew of the benefits of fish consumption. So why do we have all of this angst over scaring people away from fish? (Mahaffey)*
- A. I agree. Looking at the data, there isn't much evidence that we're scaring people away. And with regard to the Mercury Awareness in Pregnant Women study, we don't know how much fish pregnant women were eating before they were pregnant.
- Q. What languages was the survey presented in? Is it possible to include the Chinese language? Also, I wouldn't assume that the Chinese are the only Asian group we need to be looking at. Can we look at things on a regional basis? (Stahl)*
- A. We can break information out by demography and ethnicity, and I will make that suggestion.
- Q. Do you have any ideas on changes that may be necessary to increase awareness and effectiveness of the advisories? Is it important for states and tribes to talk to your management so that they know there is interest in the safety survey? When would the states be able to view the data? (Groetsch)*
- A. We need to know which groups are getting it and which aren't. And please contact EPA and FDA to make the interest known and identify what needs to be changed. Taking this stuff to your managers would be a good way to go.
- Q. Did women of childbearing age think the advisories were for women of childbearing age? Is the information available on the Web? (Knaebel)*
- A. A lot of women thought it was for women who were pregnant or might become pregnant, but I don't know if they made the leap that it was for all women of childbearing age. The general population made the assumption that it was for pregnant women and those who might become pregnant. We can provide the slides and summary analyses, but it could be a while before a report is created, and I'm not sure when this information will be placed on the Web.