

FY99-XXXI-88
FISH CONSUMPTION SURVEY:
MINNESOTA AND NORTH DAKOTA

CONTRACTOR: Energy & Environmental Research Center

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PARTICIPANTS

<u>Sponsor</u>	<u>Cost Share¹</u>
Otter Tail Power	\$13,000
Minnesota Power	\$13,000
Great River Energy	\$13,000
Minnesota Pollution Control Agency	\$25,000
U.S. Department of Energy (JSRP)	\$61,500
ND Industrial Commission	<u>\$39,000</u>
 Total Project Costs	 \$164,500

Project Schedule - 12 Months

Contract Date - 6/16/99
Start Date - 1/11/00
Completion Date - 1/1/01

Project Deliverables

Status Report - 9/30/99 ✓
Status Report - 3/31/00 ✓
Status Report - 8/31/00 ✓
Final Report - 5/31/01 ✓

OBJECTIVE / STATEMENT OF WORK

The objective of the study is to determine the fish-eating tendencies of people in North Dakota and Minnesota. The project will focus on the general public as well as target subpopulations such as women of childbearing age and American Indians. The method for assessing fish-eating tendencies is the development of a questionnaire and implementation of a survey. Hair analysis will be done on selected respondents to validate the results of the fish consumption survey. The goal of this study is to obtain statistical information for estimating health effects from fish consumption.

¹ Increased funding occurred with \$10,000 from the MPCA and a corresponding amount from JSRP.

STATUS

A total of 7,835 questionnaires were distributed to potential respondents in Minnesota and North Dakota. Nine hundred eighty-eight (988) households in Minnesota and 577 households in North Dakota responded to the questionnaire. A total of 1,565 questionnaires were returned representing a total of 4,273 individuals. The primary conclusions of the study based on the response to the questionnaire and hair analysis from 100 selected respondents include the following:

- The demographics of the survey respondents indicate the age grouping, and distribution of males, females, and children revealed minor bias compared to recent census data. Demographics of the Native American populations are not representative of national or regional Native American populations.
- Consumption of store-bought fish exceeded sport-caught fish for all populations surveyed. About 4% of all respondents reported eating no fish. About two-thirds of the fish eaten came from a store or restaurant; one-third came from fishing and netting.
- The total median fish consumption rates ranged from 1.4 to 15.1 g/day, and the estimated upper-level consumption rate (95th percentile) ranged from 4` 1.5 to 73.6 g/day.
- The total mean estimated mercury exposure through fish consumption ranged from 0.007 to 0.051 ug/kg-day and the estimated upper level exposure ranged from 0.152 to 0.380 ug/kg-day.
- Estimated mercury exposure through fish consumption determined for the sensitive populations indicates the percentage of population above EPA reference dosage level of 0.1 ug/kg-day (upper level exposure to protect human health) in Minnesota for women of childbearing age is 11.39% and for children age 0 to 14 years is 21.39%; in North Dakota the percentage of population above the EPA reference dosage level for women of childbearing age is 12.37% and for children age 0 to 14 years is 29.08%.
- Seasonal variations in consumption examined for women of childbearing age indicate that the number of meals of fish consumed in June and July was the highest and level of exposure may be 2 to 3 times higher in summer.
- Analysis of hair samples from 80 women selected from the category of childbearing age indicates low levels of mercury ranging from 0.01 to 0.64 ug/g. None of the samples contained mercury at levels to raise health concerns. The estimated mercury exposure through fish consumption was found to be 5 to 6 times higher than the levels determined from the hair analysis.
- The survey overestimates the exposure to mercury through fish consumption *or* the relationships used to calculate the mercury exposure based on hair analysis underestimates exposure.