Center for Health Effects of Environmental Contamination

2003

ANNUAL REPORT

The University of Iowa

CHEEC

IN 2003, THE UNIVERSITY OF IOWA CENTER FOR HEALTH EFFECTS OF ENVIRONMENTAL CONTAMINATION (CHEEC) built on past experience and success conducting interdisciplinary and collaborative research, and education and service programs to fulfill its legislatively mandated mission. This was accomplished through the development of environmental databases, administering a seed grant program supporting health effects research, and providing education and service programs to the citizens of the state. This report summarizes CHEEC activities and confirms its commitment

"to determine the levels of environmental contamination which can be specifically associated with human health effects."

RESEARCH

IOWA COMMUNITY PRIVATE WELL STUDY

In 2003, CHEEC completed research on the *Iowa Community Private Well Study (ICPWS)*, a cooperative research projected funded by CHEEC, the University of Iowa Hygienic Laboratory, Iowa Department of Natural Resources, and the United States Geological Survey. The study utilized the services and expertise of more than 30 county environmental health specialists plus researchers from the University of Iowa Environmental Health Sciences Research Center. The ICPWS was a one-time sampling of 103 randomly selected private wells in 50 incorporated Iowa communities without municipal water systems or rural water connections. County environmental health specialist collected water samples and completed a well construction and contaminant site survey of each well sampled. Water samples were analyzed for pesticides, nitrate, ammonia, arsenic, total coliform bacteria, and some industrial chemicals and gasoline constituents.

Total Number of Wells Sampled = 103

Contaminant	% Detections
atrazine	19%
desethylatrazine (DEA)	28%
desisopropylatrazine (DIA)	4%
metolachlor	4%
any pesticide*	32%
nitrate-N	57%
arsenic	26%
total coliform	30%

* Includes acetochlor, alachlor, atrazine, cyanazine, DEA, DIA, metolachlor, prometon

Study results

Detections: Most detections were at very low levels (parts per billion for pesticides and arsenic). Three wells had arsenic detections above the new U.S. Environmental Protection Agency's drinking water standard (0.01 mg/L– effective 2006), while 24 wells exceeded the nitrate-N standard (10 mg/L). The wells sampled as part of this study are privately owned and done a volunteer basis; they are not required to meet any drinking water standard.

Construction: Shallow wells had a higher detection frequency for nitrate-N and pesticides, yet a lower detection of arsenic and coliform bacteria. Of the wells sampled, elevated nitrate-N concentrations (>10 mg/L) were more prevalent in sand point wells and in wells that were not cased.

Conclusions:

- Elevated nitrate-N concentrations continue to be a problem, as >20% of the wells tested had levels greater than 10 mg/L.
- Occurrence of atrazine and its degradates has increased, but concentrations were lower than previous statewide surveys.
- Arsenic was detected in 24% of the wells; concentrations were generally at very low levels.
- Well depth and construction are important factors, as nitrate-N and pesticides were detected more frequently in shallow (<50 feet) than deep (>50 feet) wells.

THE CHEEC DATA MANAGEMENT CENTER

The CHEEC Data Management Center (CDMC) continues offering essential computing services for environmental health research projects conducted at the University of Iowa. CDMC staff provide programming, local area network administration, database design/administration, and applications development for in-house and state and federal funded environmental health research projects.

In 2003, CDMC contributed database design and administration, and applications development for the following research projects and activities:

- ***Comprehensive Assessment of Rural Health in Iowa (CARHI)*** in collaboration with the UI Departments of Geography, Occupational and Environmental Health, and Family Medicine. Funding support provided by the Centers for Disease Control and Prevention.
- ***Muscular Dystrophy Surveillance Tracking and Research Network (MDSTARNet)*** in cooperation with the Iowa Birth Defects Registry; funding provided by the Centers for Disease Control and Prevention.
- ***Water Quality Protection in Agroecosystems: Integrating Science, Technology, and Policy at the Watershed Scale*** in collaboration with the UI Department of Geography, funded by the US Department of Agriculture.
- Updated the ***Iowa Historical Municipal Water Treatment and Supply Database***.
- Continued providing database support for the ***Agricultural Health Study***.

CHEEC GRANT PROGRAMS

The following received funding through the CHEEC seed grant program in 2003:

Fate and Significance of a Veterinary Antibiotic in the Environment: A Laboratory Study
J Coats, T Phillips, J Belden, K Henderson, Department of Entomology, Iowa State University; T Moorman, National Soil Tilth Laboratory, U.S. Department of Agriculture

Additive Effects of Environmental Contaminants (Chemical Mixtures) on Selenium-dependent Glutathione Peroxidase
G Ludewig, L Robertson, Department of Occupational and Environmental Health, The University of Iowa

Disposition and Metabolism of N-Methyl Perfluorooctane Sulfonamidoethanol (NMeFOSE) in Rats
H Lehmler, Department of Occupational and Environmental Health, K Hornbuckle, Department of Civil and Environmental Engineering, The University of Iowa

Heartland Environmental Metal Dental Study
R Field, Department of Epidemiology and Department of Occupational and Environmental Health, L Fuortes, Department of Occupational & Environmental Health, B Smith, Department of Biostatistics, L Snetselaar, Department of Epidemiology, The University of Iowa; D Simmons, The University of Iowa Hygienic Laboratory

Are Iowa's Meat Processing Workers at Increased Risk of Zoonotic Infections?
K Myers and G Gray, Department of Epidemiology, The University of Iowa

COOPERATIVE RESEARCH PROGRAM

In 2003, CHEEC funded the following research project through its cooperative research program:

Urinary Pesticide Metabolite Levels and Reproductive Effects: A Prospective, Pilot Study of Partners of Pregnant Women in Iowa
P Romitti, Department of Epidemiology, and A Sparks, Department of Obstetrics/Gynecology and Urology, The University of Iowa

SERVICE/EDUCATION ACTIVITIES

CHEEC awarded the following education grants in 2003:

- Supported the development of materials for an onsite wastewater workshop and booklet in conjunction with the Taylor County Department of Public Health.
- Partial support for the ***Ecological Lawn and Garden Fair*** sponsored by the University of Northern Iowa Center for Energy and Environmental Education
- Partial support of the Midwest Environmental Chemistry Workshop, hosted by the University of Iowa College of Engineering.

CHEEC sponsors a continuing seminar series on environmental health issues. The following seminars were held on the University of Iowa campus in 2003.

- ***Environmental Contaminants as Hormones in Wildlife: Effects from Genes to Populations***
  Louis Guillette; Distinguished Professor of Zoology, University of Florida
- ***Water Quality Improvements During Riverbank Filtration at Three Midwest Utilities***
  Ed Bouwer, Department of Geography and Environmental Engineering, Johns Hopkins University
- ***Iowa Community Private Well Study***
  Terry Cain, University of Iowa Hygienic Laboratory and David Riley, CHEEC

CHEEC CENTER STAFF

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