



National  
**Farm**Medicine  
Center®

# **2008** Year in Review







Barbara Lee, R.N., Ph.D.

## ***From* the Director**

The National Farm Medicine Center (NFMC) and the National Children's Center for Rural and Agricultural Health and Safety stayed on track during 2008 with continued success in conducting high-quality and relevant research, publishing in peer-review journals, participating in national-level advisory boards and providing technical assistance for local and regional agricultural safety efforts.

Underpinning much of this work is a five-year, \$4.6 million competitive grant announced in September by the National Institute for Occupational Safety and Health (NIOSH). It is the third consecutive such grant awarded to the National Children's Center by NIOSH, which relies on the Center to guide its Childhood Agricultural Injury Prevention Initiative. Since establishment of the National Children's Center in 1997, the rate of childhood injuries per 1,000 farms has declined by nearly 40 percent. A timeline marking key points in the development of childhood agricultural health and safety efforts is on pages 10-11.

This 2008 Year in Review provides a glimpse into the wide range of activities conducted by our scientists and staff. We have much to be proud of. We developed a blueprint to guide and sustain our future in childhood agricultural health and safety, we expanded the scope of the *Journal of Agromedicine*, we made scientific contributions to the safety of drinking water in rural communities, and we built partnerships with research colleagues and agricultural business contacts across the country.

### **Credits**

National Farm Medicine Center  
2008 Year in Review

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# **Table of Contents**

National Leadership .....	1
---------------------------	---

Agromedicine .....	3
--------------------	---

Visitors.....	4
---------------	---

Childhood Agricultural Health & Safety.....	5
--	---

National Children's Center: Timeline .....	9
---	---

Public Health Microbiology .....	11
-------------------------------------	----

Infectious Disease Microbiology .....	12
--	----

General Staff .....	13
---------------------	----

Outreach/Administration ....	14
------------------------------	----

Publications, Presentations, Conferences .....	15
---	----

Making a Gift.....	20
--------------------	----

Acknowledgments.....	20
----------------------	----

At the same time, agriculture continues to be one of the most hazardous industries in our country and one of the few worksites where children are present. There is more work to be done – research, education, training, and clinical services.

We are grateful for our many friends, supporters and the state and federal agencies whose contribution of time and resources makes our work possible. We are especially thankful to the farm owners and laborers who try to keep us grounded, ensuring we focus on issues that are important to them.

Given the uncertainties of these economic times and the ever-changing factors affecting American agriculture, we know the road before us may be bumpy, but we stand ready to meet the challenges that lie ahead.



Barbara Lee, R.N., Ph.D.

# National Leadership

The National Farm Medicine Center pushed ahead on several initiatives in 2008 that are having an impact on national agricultural safety and health strategies. In addition, NFMC scientists and staff served on advisory boards and committees of numerous organizations, both government and private. The Center facilitated discussion on timely issues and stakeholder concerns by hosting visiting scholars, and it encouraged interdisciplinary collaboration on a national level.

- The National Children's Center for Rural and Agricultural Health and Safety received a five-year, \$4.6 million competitive grant from the National Institute for Occupational Safety and Health (NIOSH) to expand initiatives related to injury prevention on farms. Since 1996, the National Children's Center has coordinated many childhood agricultural injury prevention efforts for NIOSH.
- **Barbara Lee, Ph.D.**, led planning for the first national meeting of the Agricultural Safety and Health Council of America (ASHCA), January 29, 2009, in Washington, D.C. The meeting, held at American Farm Bureau Federation headquarters, convened leaders in farming, agribusiness, insurance, government and safety to implement a national strategy to reduce disease, injuries and fatalities in American agriculture. Dr. Lee and her staff facilitated formation of ASHCA in late 2007, and now serve

in an administrative role. ASHCA is incorporated as a not-for-profit 501 (c)(3).

- **Steven Kirkhorn, M.D., M.P.H.**, continued to serve on the National Pork Board's Public Health and Worker Safety Technical Advisory Panel. Dr. Kirkhorn also served on the board of AgriSafe, Inc., a national organization of health professionals whose clinics provide agricultural occupational health and safety education, medical surveillance, respiratory fit testing, and hearing and breathing tests.
- **Barbara Marlenga, Ph.D.**, was co-investigator on a study that indicated the ergonomic forces required to operate controls on 40 common tractor models in the U.S. typically exceeded the physical abilities of most children aged 13 to 17 years. Dr. Marlenga said the study raises serious questions about the ability of children to safely operate tractors on U.S. farms.
- **Mark Borchardt, Ph.D.**, continued his term on the Environmental Protection Agency (EPA) Science Advisory Board's Drinking Water Committee, and advises on technical issues underlying EPA policies and decision-making. He also serves on an EPA review panel to help develop the third Contaminant Candidate List to identify unregulated contaminants that may require national drinking water regulations in the future.
- Dr. Borchardt's board appointments also include: Green Tier Advisory Board, Cooperative Environmental Assistance Bureau, Wisconsin Department of Natural Resources; Reviewer of Guidelines for Canadian Drinking Water Quality – Enteric Viruses, Water, Air, and Climate Change Bureau, Health Canada; EPA's 2007 Report on the Environment: Science Report, Science Advisory Board; Canadian Water Network, Review Panel, Pathogens in Groundwater Consortium; Homeland Security Advisory Committee, Science Advisory Board, U.S. EPA.
- **Steve Foley, Ph.D.**, continued as Science Advisor for the U.S. Food and Drug Administration's Office of Regulatory Affairs, and is vice-president of the North Central Branch of the American Society for Microbiology (ASM).



**ASHCA**  
AGRICULTURAL SAFETY & HEALTH COUNCIL OF AMERICA  
Issue 1, Number 2  
Winter 2008

**Mission**  
To proactively address ongoing and emerging occupational safety and health issues affecting U.S. agriculture.

**What's Inside**  
• Executive Committee  
• Committee Reports  
• News Briefs  
• Upcoming events

**Join ASHCA!**  
Producers, agribusiness leaders, insurance companies and safety professionals are working together to reduce disease, injuries and fatalities in agriculture. We need your input, join us, and let your voice be heard. A variety of membership packages are available for individuals and organizations. "Sustaining members" who join during 2008-09 (\$5,000-plus) will be designated as Charter (Founding) Members. Visit us on the Web at [www.ashca.org](http://www.ashca.org) or phone 715-221-7275.

**ASHCA to hold first national meeting**

Leaders in farming, agribusiness, insurance, government and safety will convene January 29-30, 2009, in Washington, D.C., for the first national meeting of the Agricultural Safety and Health Council of America (ASHCA). ASHCA's founding members spent most of the past year building the not-for-profit group. Now they want to consolidate their gains and move more prominently into the public eye.

"The main purpose of this meeting is to recognize and be accountable to our members for the first year of ASHCA's formation and existence," said William Hudson, CEO, Foundation president and chair of ASHCA. "We want our members to fully understand the mission, purpose, and direction of ASHCA."

The meeting will be held at the American Farm Bureau Federation headquarters and adjacent Holiday Inn Capital. Discussion will focus on the ASHCA strategic plan for growth and development.

"We want to get a broader consensus from members on the directions that we will be taking in 2009-2010," said Dan Hais, senior vice-president of Worker's Compensation Fund and vice-chair of ASHCA.

Said Martha Durrell, Director of Program Development for the American Farm Bureau Foundation and secretary-treasurer of ASHCA, "We see this as the beginning of a movement focusing on farm safety and health."

The meeting will start with a welcome from Dale Matheson, president of Farm Bureau. Helping to speed ideas will be a panel discussion on "Critical Issues for Improving Agricultural Safety and Health at a"

(continued on page 6)

Newsletter of the Agricultural Safety and Health Council of America, produced by the NFMC.





The NPMC secured funding from the Centers for Disease Control and Prevention to help support publication of papers from the Sixth International Symposium: Public Health and the Agricultural-Rural Ecosystem in the *Journal of Agromedicine*. The editorial team included, standing (from left): Joseph Mazza, M.D., MACP; Barbara Lee, R.N., Ph.D.; Josh Lawson, Ph.D.; George Conway, M.D., M.P.H.; John Gordon, Ph.D.; Niels Koehncke, M.D. Sitting (from left): Donna Rennie, R.N., Ph.D.; Shelley Kirychuk, RN, PhD; Debra Morgan, R.N., Ph.D. Drs. Mazza and Lee are with the NPMC; Dr. Conway is with NIOSH; and the remaining guest editors pictured are from the Canadian Centre for Health and Safety in Agriculture, which hosted the Symposium in Saskatoon, Saskatchewan.

- The National Farm Medicine Center secured a \$60,000 grant from the Centers for Disease Control and Prevention (CDC) to help support an established international symposium on agricultural health and safety, and to publish an issue of the *Journal of Agromedicine* dedicated to the conference proceedings. The Sixth International Symposium: Public Health and the Agricultural-Rural Ecosystem, Oct. 19-23, in Saskatoon, Saskatchewan, Canada, drew researchers from 15 countries. The NPMC submitted an application for the grant on behalf of the symposium's co-hosts, which included six NIOSH agricultural centers and the Canadian Centre for Health and Safety in Agriculture (CCHSA) at the University of Saskatchewan.
- Dr. Lee continued her term as co-chair of the NIOSH-National Occupational Research Agenda (NORA) Sector Council on Agriculture, Forestry and Fisheries. Council members established strategic national goals and action plans that will guide federal funding priorities.
- Dr. Lee served on the U.S. Department of Agriculture Youth Farm Safety Education and Certification steering committee; the Wisconsin Injury Research Center (Medical College of Wisconsin) advisory board; and the Pacific Northwest Agricultural Research Center advisory board.
- The NPMC continued to facilitate the Childhood Agricultural Safety Network (CASN), a collaborative effort with other national youth-serving organizations to explore methods to reduce childhood agricultural injuries.
- The NPMC completed its fourth year of producing the *Journal of Agromedicine: Practice, Policy & Research*. The peer-reviewed journal examines human health issues relative to agriculture and is indexed by the National Library of Medicine. Its new publisher, Taylor & Francis Group, has boosted the journal's profile through its Web site and global publishing infrastructure.

# Agromedicine

**S**teven Kirkhorn, M.D., M.P.H., leads Agromedicine initiatives for the National Farm Medicine Center. He is medical director of both the NFMC and the Occupational Health Department of Marshfield Clinic, Marshfield, WI.

Thanks to a collaborative effort led by Dr. Kirkhorn, beginning in 2009 specially-trained nurses will provide agricultural occupational health and safety services to farmers and their families at Marshfield Clinic in Wausau and Marshfield. The initiative involves the NFMC, Marshfield Clinic Occupational Health Department and AgriSafe Network. AgriSafe is a national organization of health professionals. Their clinics provide education, medical surveillance, respiratory fit testing, and hearing and breathing tests.

As an educator, Dr. Kirkhorn serves as a clinical faculty member at the University of Wisconsin School of Medicine and Public Health's Office of Rural Health.

Dr. Kirkhorn was invited to give several talks, including the keynote "Agricultural Infections and Disease," at the Migrant and Immigrant Health in Rural

Pennsylvania Conference; "Occupational Health: Risks in Agriculture," at the American Veterinary Medical Association meeting; and "Barriers in Dairy Farm Participation in Musculoskeletal Disorder Research," at the National Institute for Farm Safety Conference.

Dr. Kirkhorn is in his fifth year of editing the *Journal of Agromedicine: Practice, Policy & Research*. This peer-reviewed journal examines human health issues relative to agriculture and is indexed by the National Library of Medicine.

Dr. Kirkhorn continued to serve on the National Pork Board's Public Health and Worker Safety Technical Advisory Panel.

In addition, Dr. Kirkhorn served on the Marshfield Area Chamber of Commerce and Industry's Agri-Business Committee and is involved with the Wisconsin Council of Rural Initiatives (CRI) Rural Health Care Committee, a spinoff of the Future of Farming and Rural Life in Wisconsin project for which he chaired the rural health sub-committee.







Mark Borchardt, pictured at lower right, and his Public Health Microbiology lab hosted a meeting that brought together U.S. Department of Agriculture, Environmental Protection Agency, U.S. Geological Survey, university and state agency specialists to evaluate technologies and innovative systems in environmental dairy management. They discussed how best to develop these technologies and systems, and ways to transfer the resulting information to public and private dairy management consultants.

## Visitors

The National Farm Medicine Center played host to national meetings and to invited scholars from across the world of agricultural safety and

health. These face-to-face meetings continued the Farm Center tradition of helping to facilitate relationships aimed at reducing injuries and fatalities.



Byron Crouse, M.D., Associate Dean for Rural and Community Health at the University of Wisconsin School of Medicine and Public Health, with medical students Connie and Nathan Gundacker. The Gundackers gave a presentation to Marshfield staff on a trip to Mexico in which they conducted preliminary research related to the North American Guidelines for Children's Agricultural Tasks (NAGCAT).



LEFT: George Di Giovanni, Ph.D., Associate Professor of Environmental Microbiology at Texas A&M University Agricultural Research and Extension Center at El Paso, gave a presentation in Marshfield on detection of waterborne pathogens. Dr. Di Giovanni was a guest of Mark Borchardt, Ph.D.

RIGHT: Rajesh Nayak, Ph.D., of the National Center for Toxicological Research, United States Food and Drug Administration, Jefferson, Arkansas, spoke in Marshfield at the invitation of Steven Foley, Ph.D.



# Childhood Agricultural Health and Safety

**B**arbara Lee, Ph.D., led a successful grant submission process that resulted in the National Children's Center for Rural and Agricultural Health and Safety receiving a five-year, \$4.6 million competitive award from the National Institute for Occupational Safety and Health (NIOSH). The award runs through fiscal 2013 and will be used to expand initiatives related to injury prevention on farms. The projects funded cover a variety of research, intervention and outreach efforts. In her role as National Children's Center Director, Dr. Lee participates in bi-annual in-person meetings and quarterly teleconferences with directors of all NIOSH-funded agricultural research centers to facilitate new initiatives and coordination across regions. In her dual role as Director of the National Farm Medicine Center, Dr. Lee facilitates implementation of the NFMC strategic plan, including administrative management, resource development and communications.

Dr. Lee and Regina Fisher, M.S., completed a project to modify current North American Guidelines for Children's Agricultural Tasks (NAGCAT) posters to be applicable for hired adolescent farm workers. The ultimate goal of this project, called "Safety Guidelines for Hired Adolescent Farm Workers (SaGHAF)," is to reduce the incidence of workplace injury and fatality to hired adolescent farm workers. The project includes user-friendly posters and other materials for employers and supervisors containing guidelines for training and supervision, as well as federal regulations. Although there are safety standards in place for youth employed in many occupations, there are currently few guidelines for youth hired to work on farms and ranches.

**Barbara Marlenga, Ph.D.**, is following up on a well-known study conducted by the National Farm Medicine Center 15 years ago. The study found that an educational intervention improved hearing protection use among Wisconsin farm youth. Nearly \$1 million has been secured to find and study the same group of individuals to see whether the increase in hearing protection use continued into adulthood, and whether that protection helped preserve hearing. Recruiting is set to begin in early 2009.

Farm tractors account for the majority of fatal injuries to adolescents working in agriculture and therefore remain a leading occupational priority. Dr. Marlenga was co-investigator on a study that indicated the ergonomic forces required to operate controls on 40 common tractor models in the U.S. typically exceeded the physical abilities of most children aged 13 to 17 years. Dr. Marlenga said the study provides objective evidence that could assist in establishment of evidence-based minimum-age recommendations for children and tractor operation. In other completed work, a new definition of "adequate adult supervision" is needed within the context of the agricultural work environment, according to results of a study co-authored by Dr. Marlenga. The study also suggests that consideration be given to restricting the access of children, especially very young children, to the agricultural worksite. The study was based on a retrospective case series of 334 pediatric farm injury cases that resulted in death or required hospitalization. Patterns of supervision were coded according to three dimensions of supervision: attention, proximity and continuity.



A high school student enters the NFMC Health Outreach Unit as part of a hearing conservation program in the 1990s. A current study is following up with program participants to see if the program had lasting effects on their hearing.





The research team for an "Evaluation of a Hearing Conservation Program for Farm Youth: A 15-Year Follow-Up." From left: Marshfield Clinic audiologist Doug Wood; Steven Kirkhorn, M.D., M.P.H.; Will Pickett, Ph.D., Queen's University (Ontario); Marcy Fitz Randolph, D.O., M.P.H.; Steven Broste, M.S.; Barbara Marlena, R.N., Ph.D.; Dick Berg, M.S.; and Mary Jo Knobloch, M.S.

**Regina Fisher, M.S.**, agricultural youth safety specialist, is the National Children's Center's primary coordinator for national outreach activities and intervention projects. This past year she continued to the development of the Safety Guidelines for Hired Adolescent Farm Workers (SaGHAF) and is now working on an intervention project to disseminate the seven guidelines to employers and supervisors of hired adolescent farm workers. This project is a collaboration with representatives from California Polytechnic State University and the Washington Department of Labor and Industries. The first workshop was scheduled to take place in February 2009. The workshops will address work conditions, teen assessment, and labor regulations for adolescents. Fisher coordinated development of resources for workshop curriculum, consisting of a series of presentations and resources. Fisher continued to serve as coordinator and liaison for the Childhood Agricultural Safety Network and its public awareness campaign, "Keep Kids Away from Tractors." She serves as technical advisor for a series of other National Children's Center projects including the North American Guidelines for Children's Agricultural Tasks (NAGCAT) and the Center's technical assistance program and reporting systems. She also played a key role in administration of the Agricultural Safety and Health Council of America.

## Operaciones básicas del tractor

### Peligros principales



### Recuerde



### Responsabilidades del supervisor

#### Condiciones del trabajo

- Asegure que todos los dispositivos de seguridad están en el lugar correcto (estructuras de protección al volcarse, cinturón de seguridad, protectores, iluminación apropiada y marcamiento)
- Complete inspección pre-operacional
- Permita solamente la operación durante el período diurno y en climas adecuados
- Asegure que el área de trabajo esté libre de peligros
- Establezca una ruta segura hacia el área de trabajo

#### Evaluación del adolescente

- Puede completamente utilizar todos los controles
- Puede usar manos y pies de manera coordinada
- Puede repetir procesos de 15-20 pasos
- Tiene una actitud positiva de seguridad
- Tiene una buena visión periférica
- Esta alerta y ha descansado adecuadamente
- Permanece tranquilo cuando tiene presión en el empleo
- Demuestra el buen juicio ante nuevas situaciones

#### Entrenamiento y supervisión

- Asegure que el empleado ha completado el entrenamiento de certificación de uso del tractor
- Haga que el empleado demuestre capacidad de realizar con seguridad un trabajo específico
- Compruebe que el/la empleado(a) en un periodo de 30 minutos demuestre capacidad de realizar el trabajo con éxito
- Mantener contacto a través del teléfono celular o radio

### Reglamentos Federales: Acta de ley para un trabajo justo (FLSA siglas en inglés)

- Refiérase a los reglamentos generales de adolescente en el empleo. Encuentre información específica de cada estado en [www.youthrules.dol.gov](http://www.youthrules.dol.gov).
- Menores de 16 años no deben operar un tractor con más de 20 caballos de fuerza (PTO) o conectar/desconectar los implementos de la grapa de un tractor. Sin embargo, en algunos estados, adolescentes de 14 y 15 años que hallan recibido un certificado del entrenamiento para operar un tractor están exentos de esta restricción (HOSTA siglas en inglés).
- Menores de 16 años no pueden ir de pasajeros o ayudantes en un tractor; trabajar en un silo horizontal mientras operan un tractor con propósitos de embalar o empaquetar; o conducir un autobús, camión, o un automóvil al transportar pasajeros.
- Menores de 16 años no deben operar o asistir con (incluyendo poner en marcha, parar, ajustar, alimentar, o cualquier otra actividad que implique el contacto físico asociado a la operación) cualquier de las siguientes máquinas: máquina de abrir zanjas o equipo de remover terreno, carretilla elevadora, cosechadora de papas, recogedora del maíz, recogedora del algodón, cosechadora de grano, cortadora de heno, segadora de forraje, prensa de heno, cavadora de papas, o cosechadora móvil de guisantes; trituradora de alimentos, secadora de cosecha, soplador de forraje, transportador del taladro, o el mecanismo de descarga de un bágón o plataforma de auto-descarga sin gravedad; o una cavadora de poste de alto poder, conductora del poste, o máquina de movimiento rotatorio.
- Algunas leyes de seguridad y salud estatales requieren estructuras de protección contra volcamientos (ROPS siglas en inglés) y cinturones de seguridad en los tractores.

www.marshfieldclinic.org/hccnahu/  
1-800-642-4900 • Marshfield, WI  
NIOSH Grant #5-U01-HD08107

Notas:

\_\_\_\_\_



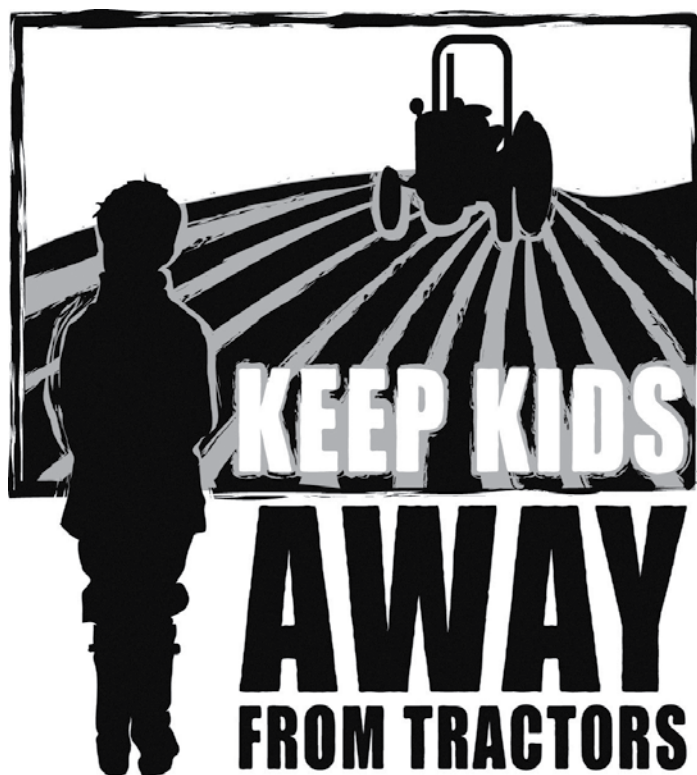
A poster (in Spanish) from the Safety Guidelines for Hired Adolescent Farm Workers (SaGHAF) project.



**Marcy Fitz Randolph, D.O., M.P.H.**, is a research specialist working with Dr. Marlenga on the hearing study 15-year follow-up, where she has contributed to survey development, document creation, and literature search. She is also working with Marshfield's Biomedical Informatics Research Center to create a Web page interface for the NAGCAT poster series. Dr. Fitz Randolph's background experience in clinical medicine, ergonomics, safety, injury epidemiology, and information science allow her to communicate easily with colleagues from the many disciplines that interact in agricultural health and safety. She also works to promote cross-disciplinary research and interventions through improved communication of research findings, especially using Internet resources.

**Amy Liebman, M.P.A.**, is the NFMC's formal consultant through the Migrant Clinicians Network (MCN). Liebman works as a "virtual" staff member from her home in Salisbury, Maryland. She handles most technical assistance inquiries related to migrant children and provides updates to NFMC staff regarding relevant research, education and policy activities at regional and national levels. Liebman played a key role in Migrant Clinicians Network being recognized as a Children's Environmental Health Champion by the U.S. Environmental Protection Agency for outstanding commitment to protecting children from environmental health risks. MCN received the award largely due to its accomplishments in an EPA Region 3-funded project on the Eastern Shore of Virginia where MCN reached more than 800 migrant farmworkers and their family members, educating them about environmental hazards and ways to minimize their exposures. Liebman also directs Saving Lives by Changing Practices, an MCN project that partners with Migrant and Community Health Centers to integrate occupational and environmental medicine into the primary care setting. This year MCN initiated a perinatal focus to this project to help address injuries and exposures to migrant women of reproductive age and their babies.

Agritourism continues to grow as farm operators seek to supplement their incomes. The U.S. Department of Agriculture estimates there are 52,000 agritourism operations in America, with more than 85 million visitors each year. That explains the popularity of the National Children's Center's "Agritourism Health and Safety Guidelines for Children." To make the



The "Keep Kids Away From Tractors" campaign won regional and national honors from the National Agri-Marketing Association



Amy Liebman, M.P.A., receives the EPA Children's Environmental Health Champion award on behalf of Migrant Clinicians Network.





Workshop Director Scott Heiberger (right) with Swedish agricultural reporter Sven Olov Karlsson at the 2008 Journalists' Workshop on childhood agricultural safety and health, Texarkana, Texas.

guidelines even more useful to operators, the Center produced two supplement booklets featuring checklist guides. The supplements allow operators to review health and safety considerations that have already been incorporated on their operations, and to inform appropriate prevention and control actions.

A National Children's Center workshop for journalists drew media professionals from eight states and Sweden in early June in Texarkana, Texas. "Children and Agriculture: Telling the Story of Hazards and Injury Prevention," included journalists from Progressive Farmer magazine, the Portland Oregonian and the Arkansas (Little Rock) Democrat Gazette. In five years of the annual workshop, 50 journalists have participated.

The current National Children's Center grant includes a new project, "Motivating Farm Parents to Create Safe Play Areas on Farms." A project planning meeting took place at the headquarters of American Family Insurance. From left: Tammy Ellis, National Children's Center; Eileen Fisher, Ph.D., University of Iowa; Po-Huang Chyou, Ph.D., Marshfield Clinic Research Foundation; and Mondale Smith and Steve Tjugum, American Family Insurance.





# National Children's Center for Rural

## Our Mission

*"To enhance the health and safety of all children exposed to hazards associated with agricultural work and rural environments."*

In 2008, the National Children's Center was awarded its third consecutive five-year competitive grant by the National Institute for Occupational Safety and Health (NIOSH). The National Children's Center is the only NIOSH agricultural center focused on children's issues, and has been housed within the National Farm Medicine Center at Marshfield Clinic, Marshfield, WI, since its inception in 1997. Milestones include:

## 1992

- National Childhood Agricultural Injury Prevention Symposium convened by National Farm Medicine Center in Marshfield, WI.
- National Farm Medicine Center funded by Federal Maternal and Child Health Bureau as a Children's Safety Network Rural Center.



## 1996

- National Farm Medicine Center leads national committee in development of National Action Plan for Childhood Agricultural Injury Prevention, subsequently adopted and funded by Congress.

## 1997

- National Children's Center for Rural and Agricultural Health and Safety formally established with five-year competitive grant from the National Institute for Occupational Safety and Health (NIOSH).

## The Summit

Nearly 100 farmers, growers, researchers, educators, physicians and others convened in Minneapolis for the "2001 Summit on Childhood Agricultural Injury Prevention" to review the 1996 National Action Plan and plan for the future. The resulting publication is the most comprehensive injury prevention ever since. See the Summit.



## 1999

- North American Guidelines for Children's Agricultural Tasks (NAGCAT) released.



# and Agricultural Health and Safety



vention,” which assessed progress on  
and updated recommended actions for  
ion has guided childhood agricultural  
tor Herb Kohl secured funding for



## 2001

- Migrant and Seasonal Hired Adolescent Farmworkers: A Plan to Improve Working Conditions published.

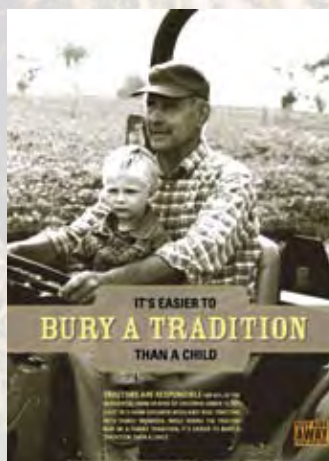
**MIGRANT AND SEASONAL HIRED ADOLESCENT FARMWORKERS:**  
A PLAN TO IMPROVE WORKING CONDITIONS

*Recommendations from the  
National Adolescent Farmworker  
Occupational Health and Safety  
Advisory Committee*



## 2003

- NIOSH awards five-year competitive grant to National Children's Center for Rural and Agricultural Health and Safety.
- Creating Safe Play Areas on Farms published.



## 2006

- The national public awareness campaign, “Keep Kids Away from Tractors,” launched.
- Agritourism: Health and Safety Guidelines for Children published.

## 2008

- NIOSH awards five-year competitive grant to National Children's Center for Rural and Agricultural Health and Safety, its third consecutive center grant.





# Public Health Microbiology

The laboratory of **Mark Borchardt, Ph.D.**, as part of its work with the U.S. Department of Agriculture laboratory in Marshfield (a unit of the Institute for Environmentally Integrated Dairy Management), developed and validated a method for simultaneously collecting pathogenic viruses, bacteria and protozoa from agricultural runoff water using an inexpensive glass wool filter, providing an alternative to current methods for concentrating multiple varieties of waterborne pathogens that require multiple methods or complicated and expensive equipment. Collection data will be used to evaluate runoff of pathogens from fields resulting from different manure/crop/tillage management practices.

The lab also completed the data collection phase of the Environmental Protection Agency-funded Wisconsin Water and Health Trial for Enteric Risks Study. The study involves samples from 14 community water

systems and findings will help guide EPA policy on protecting groundwater resources and public health.

**Phil Bertz**, research associate, traveled to all 14 communities to collect water samples and maintain UV reactors, driving nearly 20,000 miles. He was involved with the processing and culturing for enteric viruses from those samples as well. **Matt Volenec**, research associate, worked primarily on the WAHTER Study, splitting his time between collecting water samples in participant communities, testing the samples for enteric viruses, and maintaining the UV reactors.

**Sue Spencer**, senior research associate, assisted with a major study that assessed the link between antibiotic use in the poultry industry and antibiotic resistance of bacteria in humans, detecting streptogramin resistance genes and inducible resistance in enterococcal isolates from poultry and humans. She also developed methods to quantitate enteric viruses in groundwater and



Matt Volenec, left, and Phil Bertz worked extensively on the Environmental Protection Agency-funded Wisconsin Water and Health Trial for Enteric Risks (WAHTER) Study.



evaluated the effectiveness of *Cryptosporidium* removals in water treatment processes.

The lab continued research into Madison, WI, city wells. The work was funded by the Wisconsin Department of Natural Resources, and has helped guide the Madison Water Utility in adjusting its chlorination levels. A key finding is that deep confined aquifers can be more vulnerable to contamination by human gastrointestinal viruses than commonly believed.

In June, Dr. Borchardt's lab hosted a meeting that brought together U.S. Department of Agriculture, Environmental Protection Agency, U.S. Geological Survey, university and state agency specialists to evaluate technologies and innovative systems in environmental dairy management. They discussed how best to develop these technologies and systems, and ways to transfer the resulting information to public and private dairy management consultants.



## Infectious Disease Microbiology

The laboratory, headed by **Steve Foley, Ph.D.**, conducted research on the genetics of antimicrobial resistance and disease-causing mechanisms utilized by pathogens that arise through the food chain. The Infectious Disease Laboratory is exploring the genetics of *Salmonella* pathogenicity and antimicrobial resistance. Recently, the lab team found a unique series of genes encoding what is known as a secretion system in a number of highly antimicrobial-resistant strains of *Salmonella*. Secretion systems are known to facilitate the invasion of host cells and facilitate the spread of antimicrobial resistance among bacteria. Results of this initial work were presented at the annual meetings of the American Society for Microbiology and the American Veterinary Medical Association. Ongoing work is being conducted to further pinpoint the exact function of the secretion system and whether strategies can be developed to reduce the spread of antimicrobial-resistant pathogens.

**Donna David**, senior research associate, worked on developing methodology to track pathogenic *E. coli*,

which included the identification of virulence factors and genetic profiling. She was also involved in the sequencing analysis of multi-drug resistant *Salmonella*.





# General Staff

**Tammy Ellis**, research program associate, led the Center's dissemination of "Agritourism Health and Safety Guidelines for Children" to agritourism operators. Ellis presented the guidelines to a receptive audience as keynote speaker at the North American Farmers Direct Marketing Association annual conference, held in February in Wisconsin Dells, WI. Ellis edited two supplemental checklist resources to accompany and improve the usability of the guidelines. She also worked on the Journalists' Workshop, Safe Play Research project and Childhood Agricultural Safety Network, in addition to providing technical assistance for the Center.

**Jenni Heeg**, administrative secretary, took over primary responsibility for updating content on the Center's Web site. She worked extensively with the Public Health Microbiology Lab and the Infectious Disease Lab, and provided general support to all NFMCC staff.

**Scott Heiberger**, communications specialist, continued to edit, write and handle media relations for the Center, in addition to taking on those duties for the Agricultural Safety and Health Council of America (ASHCA). Heiberger completed his fourth year as managing editor of the *Journal of Agromedicine*, and also assisted on the Childhood Agricultural Safety Network's public awareness campaign, "It's easier to bury a tradition than a child." Heiberger continued to represent the Center at national meetings of agricultural media associations.

**Ruth Mueller**, administrative secretary and editorial assistant for the *Journal of Agromedicine*, worked

with new publisher Taylor and Francis as the Journal converted to an online proofing system. Mueller continued to coordinate correspondence amongst authors, reviewers and NFMCC editors, and track all papers through the review process. Mueller also devoted significant time to the Agricultural Safety and Health Council of America (ASHCA), assisting in preparation for the first ASHCA national meeting.

**Marlene Stueland**, center manager, provided professional support and financial management to the center director, research scientists and staff. She manages the NFMCC's major meetings and is responsible for NFMCC fiscal management, procedures and project implementation.



Jenni Heeg (left) & Ruth Mueller, administrative secretaries.



Center Manager Marlene Stueland, left, Regina Fisher, M.S., were part of the NFMCC's work with the Agricultural Safety and Health Council of America.



Tammy Ellis led agritourism outreach for NFMCC





NFMC scientists and staff provided 100 hours of volunteer time for the third year in a row at the Rotary Winter Wonderland in Marshfield, WI. From left: Tammy Ellis, Ruth Mueller, Marcy Fitz Randolph, D.O., M.P.H., Steve Foley, Ph.D., and Donna David. Dr. Foley had the idea to utilize used laboratory petri dishes as ornaments.

## Outreach/Administration

The National Farm Medicine Center communicates results of its research to farm families and safety and health professionals. The NFMC translates research into practice via two newsletters, an annual report, Web site, media relations, formal presentations, articles in peer-reviewed journals, technical assistance to public health professionals and participation in fairs and conferences.

The administration core provides a framework to support, guide and monitor the progress of the NFMC's initiatives in research, outreach and education. It also facilitates growth through fundraising, endowments, grants and contracts.

### Highlights in 2008:

- The NFMC engaged media with press releases, personal contact and an annual workshop for journalists. The center also had booths and conducted interviews at the National Association of Farm Broadcasters meeting and at the Agricultural Media Summit.
- Published two newsletter titles. *Nurture*, published three times per year, disseminates children's rural health and safety information to professionals in the fields of health and safety, agri-business, policy-making and the media. *Cultivate*, published twice a year, keeps readers informed of all aspects of National Farm Medicine Center activities.
- NFMC researchers and staff published nearly 30 peer-reviewed articles, book chapters and official reports; and gave more than 50 presentations to conferences, workshops and community groups.



# Publications

- Loge FJ, Lambertini E, **Borchardt MA**, Basagaoglu H, Ginn TR. Effects of etiologic agent and bather shedding of pathogens on interpretation of epidemiological data used to establish recreational water quality standards. *Risk Analysis*. In Press.
- Assavasilavasukul P, Lau BLT, Harrington GW, Hoffman RM, **Borchardt MA**. Effect of pathogen concentrations on removal of *Cryptosporidium* and *Giardia* by conventional drinking water treatment. *Water Research*. 2008;42:2678-2690.
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- Fisher RM**, **Marlenga BL**. (2008). Perception of children's exposure to farm work hazards on management intensive grazing operations. National Institute for Farm Safety, Technical Paper No. 08-04.
- Lynne AM, Rhodes-Clark BS, Bliven K, Zhao S, **Foley SL**. Characterization of antimicrobial resistance in *Salmonella enterica* serotype Newport from veterinary sources. *Antimicrob Agents Chemother*. 2008;52:353-356.
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- Foley SL**, Lynne AM. Food animal-associated *Salmonella* challenges: pathogenicity and antimicrobial resistance. *J Anim Sci*. 2008;86:E173-187E.
- Tyler C, Lichti C, Diekman A, **Foley SL**. Evaluation of Differentially Expressed Proteins following Complement Exposure in Avian Pathogenic *Escherichia coli*. *Avian Dis*. 2008;52:23-27.
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- Heiberger SW**, Hanna C, **Lee BC**. Agricultural Safety and Health Workshops for Journalists: Strategies that Work. Marshfield, WI: Marshfield Clinic; 2008.
- Greenlee RT, Chyou P, Kieke A Naik YG, **Kirkhorn SR**. Prevalence of asthma in a general population cohort of farm children: Comparison of estimates based on parental report and medical record review. *J Agromedicine*. 2008;13(4):225-32.
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- Kirkhorn, SR**, **Fitz-Randolph M**, Berg R. Technical Paper: Barriers in dairy farm participation in musculoskeletal disorder research. Proceedings of the National Institute for Farm Safety Annual Meeting, Lancaster, PA; 2008
- Lee BC**, Hair DM. National councils invigorate agricultural safety and health. *J Agromedicine*. 2008;13(1):3-4.
- Westaby JD, Probst T, **Lee BC**. Leadership decision-making: a behavioral reasoning theory analysis. (Accepted in *The Leadership Quarterly*).
- Pickett W, Hagel L, Brison RJ, **Marlenga B**, Pahwa P, Koehncke N, Crowe T, Snodgrass P, Dosman JA. The Saskatchewan farm injury cohort: rationale and methodology. *Public Health Rep*. 2008;123:567-575.
- Hagel L, Pickett W, Pahwa P, Snodgrass P, Ulmer K, Day L, Brison RJ, **Marlenga B**, Crowe T, Dosman JA. Prevention of agricultural injuries: need for application of the full public health model. *Inj Prev*. 2008;14:290-295.



# ***Presentations***

Pickett W, Dostaler S, Berg RL, Brison RJ, Linneman JG, **Marlenga B**. Hospitalized head injuries in agricultural settings: who are the vulnerable groups? *Accid Anal Prev*. 2008;40:1943-48.

Fathallah F, Chang J, Berg RL, Pickett W, **Marlenga B**. Forces required to operate controls on farm tractors: implications for young operators. *Ergonomics*. 2008;51:1096-108.

Morrongiello BA, Pickett W, Berg RL, Linneman JG, Brison RJ, **Marlenga B**. Adult supervision and pediatric injuries in the agricultural worksite. *Accid Anal Prev*. 2008;40:1149-56.

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Pickett W, Brison RJ, **Marlenga B**. A visit to the coroner's office (guest editorial). *J Agric Saf Health*. 2008;14(3):259.

National Children's Center for Rural and Agricultural Health and Safety. Childhood Agricultural Safety Network 2009 Calendar. Marshfield, WI: Marshfield Clinic; 2008.

National Children's Center for Rural and Agricultural Health and Safety. Policies and Procedures Guide: Supplement A to Agritourism Health and Safety Guidelines for Children. Marshfield, WI: Marshfield Clinic; 2008.

National Children's Center for Rural and Agricultural Health and Safety. Worksite Guide: Supplement B to Agritourism Health and Safety Guidelines for Children. Marshfield, WI: Marshfield Clinic; 2008.

## **North American Farmers Direct Marketing Association Annual Meeting**

February 20, Wisconsin Dells, WI "Taking for Granted the Safety of the Youngest Visitors," Tammy Ellis

## **Midstate Technical College**

March 14, Marshfield, WI  
"Ergonomics," Marcy Fitz-Randolph

## **Migrant and Immigrant Health in Rural**

**Pennsylvania Conference**, Pennsylvania Office of Rural Health, Penn State University Keynote Address  
March 25, Gettysburg, PA  
"Agricultural Infections and Disease," Steve Kirkhorn

## **La Salud y Las Pesticidas**

April 4, Juárez, Chihuahua, México  
"Pesticidas y Historia," Amy Liebman

## **Sixth National Water Quality Monitoring Conference: Key to Understanding Our Waters, National Monitoring Council**

May 18-22, Atlantic City, NJ  
"Large volume automated sample collection techniques for determination of enteric viruses in water," Mark Borchardt

## **American Society for Microbiology**

June 1-6, Boston, MA  
"Sequencing of a VirB/D4 Type IV Secretion System Containing Plasmid from *Salmonella enterica* Serotype Heidelberg," Steve Foley

## **American Society for Microbiology**

June 1-6, Boston, MA  
"Virus concentrations in non-chlorinated municipal drinking water: association with community rates of acute gastrointestinal illness," Mark Borchardt

## **American Society for Microbiology**

June 1-6, Boston, MA  
"Simultaneous concentration of pathogenic viruses, bacteria, and protozoa from water using sodocalcic glass wool filters," Susan Spencer

## **Children and Agriculture: Telling the Story of Hazards and Injury Prevention Journalists' Workshop**

June 5 and 6, Texarkana, TX  
"Childhood Agricultural Injury in the U.S.," and  
"Strategies for Protecting Children from Agricultural Hazards: Evidence Myths and Black Holes," Barbara Lee



**Children and Agriculture: Telling the Story of Hazards and Injury Prevention Journalists' Workshop**

June 6, Texarkana TX

"Reflections, Reactions and Story Leads," and "Depictions of agricultural safety in the media-what images tell us," Scott Heiberger

**Children and Agriculture: Telling the Story of Hazards and Injury Prevention Journalists' Workshop**

June 6, Texarkana TX

"Agritourism Health and Safety for Children," and "Pet Peeves of the Safety Specialist and the Journalist," Tammy Ellis

**Conference on Antimicrobial Resistance in Zoonotic Bacteria and Foodborne Pathogens**

June 15-18, Copenhagen, Denmark

"Genetic Characterization of Antimicrobial Resistance in *Salmonella* Serovars Associated with Food Animals and Invasive Human Infection," Steve Foley

**National Institute for Farm Safety Conference Plenary Panel on National Initiatives**

June 24, Lancaster, PA

"National Occupational Research Agenda (NORA) Agriculture, Forestry and Fishing Sector Council," Barbara Lee

**National Institute for Farm Safety Conference**

June 25, Lancaster, PA

"Prevention of Agricultural Injuries: Need for Application of the Full Public Health Model," "Forces required to operate controls on farm tractors: Implications for youth operators," and "Ability of youth operators to reach farm tractor controls," Barbara Marlenga

**National Institute for Farm Safety Conference**

June 25, Lancaster, PA

"Development of Safety Guidelines for Hired Adolescent Farm Workers," and "Perception of Children's Exposures to Farm Work Hazards on Management Intensive Grazing Operations," Regina Fisher

**National Institute for Farm Safety Conference**

June 25, Lancaster, PA

"Barriers in Dairy Farm Participation in Musculoskeletal Disorder Research," Steve Kirkhorn

**American Veterinary Medical Association Annual Meeting**

July 19-22, New Orleans, LA

"Transfer of VirB/D4 type IV secretion system among *Salmonella enterica* serovar Heidelberg from turkeys," Steve Foley

**American Veterinary Medical Association**

July 22, 2008. New Orleans. LA

"Occupational Health: Risks in Agriculture," Steve Kirkhorn

**Marshfield Clinic Grand Rounds**

July 25, Marshfield, WI

"The Role of Treatment Guidelines in Worker's Compensation," Steve Kirkhorn

**Wisconsin Academy for Rural Medicine Symposium**

August 6, 2008. Marshfield, WI

"An overview of the National Farm Medicine Center," Scott Heiberger

**Wisconsin Rural Water Association Symposium on Viruses in Municipal Water Systems: Research, Regulations, & Disinfection Responses,**

September 4, Plover, WI

"Wisconsin WAHTER Study Part 1: Risk of Illness from Municipal Groundwater Consumption," and

"Wisconsin WAHTER Study Part 2: Risk of Illness from Contaminated Distribution Systems," Mark Borchardt

**CommuniCare Health Center**

September 8, Davis, CA

"Integrating Environmental and Occupational Health into Perinatal Care for Migrant Women," Amy Liebman

**Gaylord Nelson Institute of Environmental Health, Gaylord Nelson Institute. UW-Madison, Community and Environmental Health Forum**

September 19, Madison, WI.

"Community and Environmental Health Issues Relating to Agriculture and Rural Areas," Steve Kirkhorn

**Washington Department of Labor and Industries**

September 22, Olympia, WA

"National Children's Center for Rural and Agricultural Health and Safety," and "Safety Guidelines for Hired Adolescent Farm Workers," Barbara Lee



**Marshfield Clinic 13th Annual Occupational Health Conference**

October 3, Eau Claire, WI

“Assessing Causation in Worker’s Compensation,”  
Steve Kirkhorn

**Sixth International Symposium: Public Health and the Agricultural Rural Ecosystem**

October 21-23, Saskatoon, SK, CA

“Children and the agricultural work environment:  
Building a case for change,”

Saskatchewan Farm Injury Cohort Study 1: Rationale  
and methodology,”

Saskatchewan Farm Injury Cohort Study 2: Prevention  
of agricultural injuries and the need for application of  
the full public health model,”

Saskatchewan Farm Injury Cohort Study 3: Application  
of novel communication technologies to the study of  
farm families-a randomized controlled trial,”

“Removing the farm family exemption from the  
hazardous occupations orders for agriculture: Impact on  
injuries,” and

“Perception of children’s exposures to farm work  
hazards on management intensity grazing operations,”  
Barbara Marlenga

**Sixth International Symposium: Public Health and the Agricultural Rural Ecosystem**

October 20 and 21, Saskatoon, SK, CA

“Evaluation of the Childhood Agricultural Safety  
Network,” and

“Development of Safety Guidelines for Hired  
Adolescent Farm Workers,” Barbara Lee

**National Summit of Clinicians for Healthcare Justice**

October 23, Washington, D.C.

“Advancing Healthcare for Those Most at Risk:  
Pregnancy and Pesticides-A Risky Combination,”  
Amy Liebman

**American Public Health Association 136th Annual Meeting**

October 27, San Diego, CA,

“Dying to work: The risks from injury and death on  
the migrant’s journey to work in the United States,”  
Amy Liebman

**Nelson Institute for Environmental Studies,  
University of Wisconsin**

November 21, Madison, WI

“Viruses in Madison’s Deep Wells: The Unexpected  
Effect of Heavy Precipitation,” Mark Borchardt

**FDA National Center for Toxicological Research  
Food Protection Seminar Series**

November, Jefferson, AR

“*Salmonella* Challenges: Antimicrobial Resistance and  
Virulence,” Steve Foley

**Health and Safety in Western Agriculture - New  
Paths**

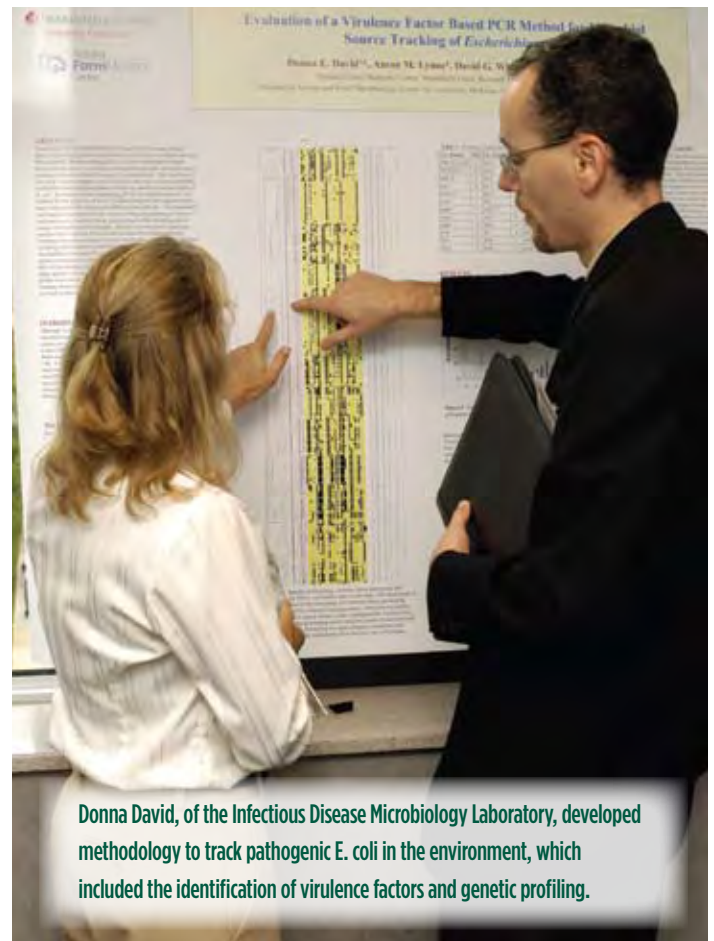
November 12, Cle Elum, WA

“Childhood Agricultural Injuries in the U.S.; Current  
Status, Interventions, Evidence and Major Gaps,”  
Barbara Lee

**CommuniCare Health Educator Conference**

December 5, Davis, CA

“Integrating Pesticide Safety Education into Perinatal  
Care of Migrant Farmworker Women,” Amy Liebman,



Donna David, of the Infectious Disease Microbiology Laboratory, developed methodology to track pathogenic *E. coli* in the environment, which included the identification of virulence factors and genetic profiling.



# **Childhood Agricultural Safety Network Members**

AgriSafe Network  
Spencer, IA

Contact: Natalie Roy

American Farm Bureau Federation  
Washington, DC

Contact: Marsha Purcell

Association of Farmworker Opportunity Programs  
Washington, DC

Contact: Heather Anderson

Canadian Agricultural Safety Association  
Winnipeg, Manitoba, Canada

Contact: Glen Blahey

Farm Safety Association  
Guelph, Ontario, Canada

Contact: Dean Anderson

Farm Safety 4 Just Kids  
Urbandale, IA

Contact: Marilyn Adams

Migrant Clinicians Network  
Austin, TX

Contact: Amy Liebman

National Center for Farmworker Health  
Buda, TX

Contact: Sylvia Partida

National Children's Center for Rural and Agricultural  
Health and Safety

Marshfield, WI

Contact: Regina Fisher

National Education Center for Agricultural Safety  
Peosta, IA

Contact: Dan Neenan

Progressive Agriculture Foundation  
Birmingham, AL

Contact: Susan Reynolds

Safe Kids Canada  
Toronto, Ontario, Canada

Contact: Pam Fuselli

SAFE KIDS Worldwide  
Washington, DC

Contact: Alan Korn

Washington Department of Labor and Industries  
Olympia, WA

Contact: Mary E. Miller



## **Childhood Agricultural Safety Network**



## Making a gift

Private donations, including funds from the annual Auction of Champions, provide a significant contribution to the work of the NFMC. The donations support research and outreach on issues that affect farmers and rural residents, including occupational health, child safety and water quality.

Donors also have the option of directing their gifts to endowments honoring the research and leadership of former NFMC Medical Directors Dean Emanuel, M.D., and Dean Stueland, MD, MPH.

To make a gift, please visit the Marshfield Clinic Development Department Web site, <http://www.marshfieldclinic.org/contributors/pages/> or call 1-800-858-5220.

## Acknowledgments

The National Farm Medicine Center expresses its thanks to the organizations and individuals that enable the NFMC to keep pace with evolving health and safety concerns in agriculture.

Marshfield Clinic provides one-third of NFMC base funding, and contracts and federal grants account for most of the rest, with the National Institute for Occupational Safety and Health (NIOSH) providing two key grants:

Award no. U50 OH008107-05

Award no. 1 R01 OH009392-01

The 2008 Auction of Champions featured a diverse list of bid packages, including a trip to the 2009 Country Music Association Music Festival in Nashville, escorted by singer-songwriter Michael Peterson. Gene Hemphill of New Holland, co-sponsor of the Nashville package, joined NFMC staff at the Auction. From left: Mark Borchardt, Ph.D.; Steven Kirkhorn, M.D., M.P.H.; Marlene Stueland; Tammy Ellis; Scott Heiberger; Barbara Lee, Ph.D.; Steve Foley, Ph.D.; Barbara Marlenga, Ph.D.; Gene Hemphill; Jenni Heeg; Ruth Mueller; Regina Fisher, M.S.; Donna David; Sue Spencer; Phil Bertz; Matt Volenec.





## **NFMC Mission**

**To conduct high quality research addressing human health  
and safety associated with  
rural and agricultural work, life and environments.**



**National Children's Center**  
for Rural and Agricultural Health and Safety

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and [www.nagcat.org](http://www.nagcat.org)**

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