

PUBLIC HEALTH & THE AGRICULTURAL RURAL ECOSYSTEM (PHARE):
SIXTH INTERNATIONAL SYMPOSIUM

AWARD CLOSEOUT FINAL PROGRESS REPORT

Barbara C. Lee, RN, PhD, Principal Investigator
National Farm Medicine Center
Marshfield Clinic Research Foundation
Marshfield, WI USA

John R. Gordon, PhD, Co-Investigator
Canadian Centre for Health and Safety in Agriculture
Saskatoon, Saskatchewan, Canada

Grant Number: 1 R130H009571-01
09/01/2008 – 8/31/2009

Submitted November 6, 2009

A) FINAL PROGRESS REPORT

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Terms and Abbreviations

CASA	Canadian Agricultural Safety Association
CCHSA	Canadian Centre for Health and Safety in Agriculture
FARSHA	Farm and Ranch Safety and Health Association
NFMC	National Farm Medicine Center
NIOSH	National Institute for Occupational Safety and Health
NORA	National Occupational Research Agenda
PHARE	Public Health and the Agricultural Rural Ecosystem

Abstract

The 6th International Symposium: Public Health & the Agricultural Rural Ecosystem, was held October 19-23, 2008, in Saskatoon, Saskatchewan. It was organized by the Canadian Centre for Health and Safety in Agriculture with assistance of the NIOSH-funded National Children's Center for Rural and Agricultural Health and Safety in Marshfield, Wisconsin. Each NIOSH Agricultural Research Center hosted a roundtable or scientific session. The event addressed a wide spectrum of health and safety issues related to rural and agricultural environments. Symposium objectives were to: 1) describe and share state of the art science; 2) provide recommendations for further research and study areas; 3) provide recommendations for policy, health promotion and prevention; and 4) disseminate knowledge through a special issue of the *Journal of Agromedicine: Practice, Policy & Research*.

All symposium objectives were achieved. The four major themes of this symposium, what we breathe, what *we eat and drink*, *how we work* and *how we live*, provided an innovative framework for discussion and scientific presentations on issues and challenges facing the future health and safety of agricultural and rural workers and families. Agricultural exposures, food safety and zoonoses, clean water, injuries, stress, and socioeconomic determinants of health of agricultural workers are examples of crucial issues addressed in this symposium under the four themes. Sessions on musculoskeletal injury and the health of temporary labor such as hired farm workers and migrant workers were particularly consistent with the National Occupational Research Agenda (NORA) Agricultural, Forestry and Fishing Sector Council agenda.

The five-day event included two pre-conference workshops, eight plenary sessions, 42 concurrent sessions, poster displays, exhibits, receptions and a gala dinner. Attendance included 222 registered participants, comprised of 150 Canadians, 52 from the U.S. and 20 international attendees from 15 other countries. Associated with the symposium were meetings of various agencies and organizations, including scientists of eight NIOSH Agricultural Research Centers meeting with the Director of the NIOSH Agriculture, Forestry and Fishing program.

In addition to the CDC/NIOSH conference support grant, the major contributor was the Canadian Centre for Health and Safety in Agriculture (CCHSA) which provided direct financial support as well as staffing. Other sponsors included the Canadian Rural Health Research Society, Saskatchewan Health Research Foundation, College of Medicine Travel Support, University of Saskatchewan Conference Fund, Canadian Institutes of Health Research and the National Farm Medicine Center, of Marshfield, WI All revenue was expended and there are no outstanding debts from the event.

CCHSA scientists were guest editors for a dedicated issue of the *Journal of Agromedicine*. They efficiently processed manuscripts authored by symposium attendees. Volume 14, No. 2 of the journal was in print by July 2009, nine months following the event. This 288-page journal issue features the majority of publications (n =30) emanating from the symposium.

Other key outcomes are noted. The 2008 symposium was a culminating event for the six years of funding for the CCHSA national training program "Public Health and the Agricultural Rural Ecosystem" (PHARE). Past and current PHARE trainees, faculty and mentors were participants in the symposium and they met and planned the successful re-application of the PHARE program, which now includes an international component with six years of funding from the Canadian Institutes of Health Research. From this endeavor several pilot projects have been funded with topics related to agricultural, rural and public health issues.

Section 1.

Highlights and Significant Findings

The 6th International Symposium: Public Health & the Agricultural Rural Ecosystem, was held October 19-23, 2008, in Saskatoon, Saskatchewan. It was organized by the Canadian Centre for Health and Safety in Agriculture with assistance of the NIOSH-funded National Children's Center for Rural and Agricultural Health and Safety in Marshfield, Wisconsin. This sixth international symposium built on successes of previous events, dating back to 1977 when the first symposium addressed grain dust exposures in agriculture. Consistent with five previous symposia, a highlight was the opportunity for attendees to gain knowledge on an array of topics, and interact with leading scientists in various fields of inquiry. The symposium planners have refined the program format to facilitate maximum networking among participants. While the meeting itself was run in a thoroughly professional manner, its atmosphere was more informal such that discussion and casual conversation between all attendees occurred throughout the event. Thus, among the 222 registered participants, plenary and symposium speakers and chairs mixed easily with all from young trainees to senior investigators, whether they were from North America or any of the other 17 countries represented.

The five-day event included two pre-conference workshops, daily morning and afternoon plenary sessions, 42 concurrent sessions, poster displays, exhibits, receptions and a gala dinner event. Registered attendees included 150 Canadians, 52 from the U.S. and 20 international attendees. Associated with the symposium were meetings of various organizations, including scientists of eight NIOSH Agricultural Research Centers meeting with the Director of the NIOSH Agriculture, Forestry and Fishing program. Other groups included the Canadian Rural Health Research Society's annual meeting, the Canadian Centre for Health and Safety in Agriculture (CCHSA) Board of Directors meeting, Agricultural Health and Safety Network Agricultural Producers' Day, a mini-symposium of Rural Nursing, and the Saskatchewan Injury Research Group. Additionally, the Canadian Agricultural Safety Association (CASA) convened their annual meeting immediately following the symposium.

The symposium program included a print and CD version of all accepted abstracts. A mere nine months following the event, Volume 14, No. 2 issue of *Journal of Agromedicine: Practice, Policy & Research* included 28 full manuscripts and two editorials from the event. Additional publications were released in subsequent issues of *Journal of Agromedicine* and other outlets.

In addition to the CDC/NIOSH conference support grant, the major symposium contributor was the CCHSA which provided funds and staffing. Other sponsors included the Canadian Rural Health Research Society, Saskatchewan Health Research Foundation, College of Medicine Travel Support, University of Saskatchewan Conference Fund, Canadian Institutes of Health Research and the National Farm Medicine Center, of Marshfield Clinic Research Foundation. All revenue was expended and there are no outstanding debts from the event.

Translation of Findings

Symposium organizers did not attempt to translate specific findings associated with the 222 participants of an international symposium. Given the study results depicted in published abstracts and manuscripts, along with the development of new research and programmatic collaborations, there will likely be numerous interventions to be employed in worker health, professional training and public education.

Outcomes. Relevance and Impact

The most tangible outcome of this symposium is the successful execution of a major event that required three years of planning and complex coordination. With more than 200 registered attendees in addition to local faculty and staff, it is a compliment to the entire planning team and speakers that formal and informal evaluation feedback confirmed a successful event.

All four symposium objectives were achieved: 1) to describe and share state of the art science; 2) to provide recommendations for further research and study areas; 3) to provide recommendations for policy, health promotion and prevention; and 4) to disseminate knowledge through a special issue of the *Journal of Agromedicine Practice, Policy & Research*.

Relevance of the symposium is reflected in its four major themes of what *we breathe*, what *we eat and drink*, *how we work* and *how we live*. These themes provided the framework for discussion and scientific presentations on issues and challenges facing the future health and safety of agricultural and rural workers and families. Agricultural exposures, food safety and zoonoses, clean water, injuries, stress, and socioeconomic determinants of health of agricultural workers are examples of crucial issues addressed in this symposium under the four themes. Sessions on musculoskeletal injury and the health of temporary labor such as hired farm workers and migrant workers were particularly relevant since they were consistent with the *newly* released National Occupational Research Agenda (NORA) Agricultural, Forestry and Fishing Sector Council agenda.

Integrated within the symposium, the CCHSA's Saskatchewan Agricultural Health and Safety Network hosted a "Prepare for Farm Safety" workshop for producers that provided the opportunity for researchers and producers to mingle. One of the speakers, a rancher and consultant to Farm and Ranch Safety and Health Association (FARSHA), located in British Columbia, focused on Low Stress Cattle Handling which results in a manageable herd, reduced shrinkage at shipping, less stress, and increased safety for the handler. Those who attended the workshop left with a wealth of knowledge and asked CCHSA to host more of these types of workshops. As a result, additional Low Stress Cattle Handling workshops were convened for feed lot workers, farmers, trucking companies, and others in the winter of 2008. In 2009-2010 they intend to host additional workshops throughout Saskatchewan adding in a train-the-trainer portion.

While it is not feasible to fully account for all the outcomes of an event such as this, feedback received from evaluation survey forms at the event and via subsequent correspondence suggested that this was a very valuable experience for all attendees. The various brainstorming sessions, quiet back-table discussions, and multiple workshop proposals that arose all hold promise of further fostering agricultural and rural health and safety causes.

The ultimate impact of the symposium is difficult to confirm. However, it is important to note that this symposium, combined with past and future such events, are becoming milestones that mark some of the major advancements in agricultural health and safety research and interventions. The fact that CDC/NIOSH conference support grant funds augmented other support for the event has its own impact. Recognition of NIOSH support in all promotional and on-site materials gives credit to CDC/NIOSH foresight in sponsoring knowledge building and networking activities. The subsequent publication of a dedicated journal issue further credited NIOSH involvement in the process, outcome and impact of the symposium.

Section 2

Scientific Report

Rural health and safety issues in agriculture and other industries present ongoing and significant challenges in research, education, prevention and outreach. With rapid changes affecting the very survival of rural people, the symposium promoted sharing of new knowledge, built relationships with other researchers from around the globe, and developed knowledge translation networks. Furthermore, it broadened perspectives to examine the social, political, and environmental impact of these changes on the health of the rural peoples around the world. The four major themes of this symposium, what *we breathe*, what we eat *and drink*, *how we work*, and *how we live*, provided a framework for discussion and scientific presentations on issues and challenges facing the health and future of agricultural and rural workers, and families. Numerous specific topics in each theme were addressed, such as agricultural health and safety, food safety, zoonoses, particulate and chemical exposures, health determinants, risk assessment and water quality. Vulnerable populations were included in several plenary and breakout sessions.

The timeline for conducting planning activities extended over a two-year period, starting in summer of 2007. Planning committee meetings were convened from fall 2007 through spring of 2008. The deadline for abstract submission was May 2008 with decisions on abstracts reported back to submitters by summer. A 120-page conference program with abstracts was printed and distributed to all participants upon arrival at the registration desk. The organizing committee was comprised of 12 internal CCHSA staff. There were 32 external scientific advisors on the planning committee. Twenty-two organizations were noted as cooperating agencies and 11 major agencies and businesses were listed as supporting agencies, providing funds.

The process of handling CDC/NIOSH conference support grant funds occurred through a series of teleconference calls between the lead Canadian team and the Marshfield, WI administrative team. A portion of funds were maintained in Marshfield to handle preparation of the dedicated issue of the *Journal of Agromedicine*. The majority of CDC/NIOSH funds were used to support participation of NIOSH Agricultural Center personnel and other speaker-related costs.

Evaluation

Evaluation of the symposium included tracking all planning activities and budgetary issues. Feedback regarding the symposium content and delivery was secured via written evaluation survey forms that were included in conference packets. These evaluation forms have been summarized and will be used for planning a potential 7th International Symposium. Informal feedback was quite positive, especially from international scientists and students that were offered travel support and waived registration fees.

One outcome of this Symposium was the so-called 2008 Saskatoon Declaration for the health, safety and living conditions of migrant workers in agriculture, drafted by Peter Lundqvist and Lesley Day (Lundqvist and Day, J Agromed, in press). The Saskatoon Declaration was discussed within a plenary session and received unanimous support from the conference delegates, as a challenge to "everyone to join in the effort and work towards the goal of healthy and safe working and living conditions for migrant workers and their families in the agricultural sector– in order to get food produced with pride & honour".

A synopsis of written evaluation feedback from plenary sessions (n=14) and individual sessions (n=224) is provided here.

SYNOPSIS OF THE SYMPOSIUM EVALUATIONS

(where: 0—not applicable; 1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree)

- I found the symposium overall to be valuable	Mean: 3.86, SD 0.36
- The symposium content reflected the four themes of how we live, how we work, what we breathe and what we eat and drink	Mean 3.71, SD 0.47
- The symposium provided access to current, state of the art science in the area of public, agricultural, and rural health	Mean: 3.77, SD 0.60
- The topics presented reflected scientifically sound research and / or evidence based practice	Mean: 3.71, SD 0.47
- The website for the symposium was well designed	Mean: 3.36, SD 0.63
- I found the symposium to be well organized overall	
- I found the symposium to be well organized in the areas of:	
Communication ahead of the symposium	Mean: 3.55, SD 0.52
Communication during the symposium	Mean: 3.64, SD 0.51
Assistance with arrangements, logistics, etc	Mean: 3.40, SD 0.52
Registration	Mean: 3.73, SD 0.47
- The conference facilities were appropriate (hotel, meeting rooms, etc)	Mean: 3.73, SD 0.47
- I would participate in similar symposia in the future	Mean: 3.55, SD 0.69
- The registration fee for the conference was reasonable	Mean: 3.12, SD 0.83
- The location and venue of the Gala dinner (away from the conference site) was acceptable	Mean: 3.80, SD 0.42
- Notification of abstract acceptance was sufficiently early to allow travel planning, etc.	Mean: 2.60, SD 1.84

COMMENTS:

Very well organized, Well done.

Great networking conference, too many concurrent sessions-difficult to pick

Construction in venue made venue very dirty - troublesome for asthma

It was very valuable to meet academic researchers from other provinces and countries

The plenary sessions were very worthwhile to attend and gave a good perspective of rural living in other countries

The overlap in tractor related sessions could have been eliminated Hard to book flights. Website information

did not seem current, kept changing

A nice variety of plenary speakers

I generally found the science was pretty good although presentation styles were pretty variable (some hard to hear).

was encouraged to hear that past symposiums make real change in policy. I would love to see the next symposium focus on legislation

Less sessions would be advised because attendance in most of my sessions were 10-12 (persons)

The symposium was top notch

For the breakout sessions - having time to talk would be helpful

The venue was nice because we could walk

Need two months in advance for abstract acceptance

Website missed some critical information for planning I

would like to see more women as plenary speakers

Some talks on the same topics (different session) were scheduled at the same time I would have preferred them being spread out

Great meeting

SYNOPSIS OF THE SESSION PARTICIPANT EVALUATIONS (N=224-2421)

I found the session to be relevant to the area rural or agricultural health	Mean: 3.76, SD: 0.47
Information provided was of educational value to me.	Mean: 3.63, SD: 0.54
Information provided will be useful to me in my work or research activities	Mean: 3.51, SD: 0.60
The topics reflected scientifically sound research and / or evidence based practice	Mean: 3.62, SD: 0.50
This topic should be covered at future symposia	Mean: 3.69, SD: 0.52

Publications: Peer-Reviewed Journal Articles

Asselin J, MacLeod M, Dosman JA. National Consultation Leads to Agrivita Research to Practice Plan for Canada. *J Agromedicine*. 2009;14(2);179-184.

Blair A, Beane-Freeman L. Epidemiologic Studies in Agricultural Populations: Observations and Future Directions. *J Agromedicine*. 2009;14(2);125-131.

Bollman RD, Reimer W. Demographics, Employment, Income, and Networks: Differential Characteristics of Rural Populations. *J Agromedicine*. 2009;14(2);132-141.

Brower MA, Earle-Richardson GB, May JJ, Jenkins PL. Occupational Injury and Treatment Patterns of Migrant and Seasonal Farmworkers. *J Agromedicine*. 2009;14(2);172-178.

Brumby S, Smith A. Train the Trainee Model: Implications for Health Professionals and Farm Family Health in Australia. *J Agromedicine*. 2009;14(2);112-118.

Burgus S, Madsen M, Sanderson W, Rautiainen R. Youths Operating All-Terrain Vehicles. *J Agromedicine*. 2009;14(2);97-104.

Chen Y, Rennie D, Cormier Y, Dosman J. Atopy, Obesity, and Asthma in Adults: The Humboldt Study. *J Agromedicine*. 2009;14(2);222-227.

Chiu BC, Blair A. Pesticides, Chromosomal Aberrations, and Non-Hodgkin's Lymphoma. *J Agromedicine*. 2009;14(2);250-255.

Cleave J, Willson P, Town J & Gordon JR. Impact of Repeated Swine Barn Dust Exposure on Airway Reactivity. *Journal of Toxicology and Environmental Health*. Part A: In press.

Cole HP, McKnight RE-I, Donovan TA. Epidemiology, Surveillance, and Prevention of Farm Tractor Overturn Fatalities. *J Agromedicine*. 2009;14(2);164-171.

Dosman JA, Chenard L, Rennie D, Beach J, Newman SC, Senthilselvan A. Reciprocal Association Between Atopy and Respiratory Symptoms in Fully Employed Female, but Not Male, Workers in Swine Operations. *J Agromedicine*. 2009;14(2);270-276.

Douphrate DI, Rosecrance JC, Reynolds SJ, Stallones L, Gilkey DP. Tractor-Related Injuries: An Analysis of Workers' Compensation Data. *J Agromedicine*. 2009;14(2);198-205.

Epp T, Parker S. Factors in Foodborne Disease Control: A Brief Overview of Issues in Changing Zoonotic Disease Transmission and the Roles of Public Health and Veterinary Professionals. *J Agromedicine*. 2009;14(2);228-234.

Farthing P, Rennie D, Punam P, Janzen B, Dosman J. The Association Between Farming Activities and Respiratory Health in Rural School Age Children. *J Agromedicine*. 2009;14(2);256-262.

Fisher RM, Berg RL, Marlenga B. Children's Exposures to Farm Worksite Hazards on Management-Intensive Grazing Operations. *J Agromedicine*. 2009;14(2);192-197.

Forbes DA, Edge DS. Canadian Home Care Policy and Practice in Rural and Remote Settings: Challenges and Solutions. *J Agromedicine*. 2009;14(2);119-124.

Gordon JR. Sixth International Symposium: Another Milestone in Agricultural-Rural Health and Safety. Editorial, *J Agromedicine*. 2009;14(2);80-81.

Gordon JR, Zhang X, Fang L, Nayyar A, Town J, Zhao X. Amelioration of Pathology by ELR-CXC Chemokine Antagonism in a Swine Model of Airway Endotoxin Exposure. *J Agromedicine*. 2009;14(2);235-241.

Hanson L, Terstappen V. Collaboration on Contentious Issues: Research Partnerships for Gender Equity in Nicaragua's Fair Trade Coffee Cooperatives. *J Agromedicine*. 2009;14(2);105-111.

Kent-Wilkinson A, Starr L, Dumanski S, Fleck J, LeFebvre A., Child A. International Nursing Student Exchange: Rural and Remote Clinical Experiences in Australia. *J Agromedicine*. 2010; 15(1); In press.

Kirychuk SP, Reynolds SJ, Koehncke N, Nakatsu J, Mehaffy J. Comparison of Endotoxin and Particle Bounce in Marple Cascade Samplers With and Without Impaction Grease, *J Agromedicine*. 2009;14(2);242-249.

Kisby GE, Muniz JF, Scherer J, Lasarev MR, Koshy M, Kow YW, McCauley L. Oxidative Stress and DNA Damage in Agricultural Workers. *J Agromedicine*, 2009;14(2);206-214.

Lawson JA, Dosman JA, Rennie D, Beach J, Newman SC, Senthilselvan A. Relationships Between Indoor Environment and Asthma and Wheeze Severity Among Rural Children and Adolescents. *J Agromedicine*. 2009;14(2);277-285.

Lundqvist P, Day L. The 2008 Saskatoon declaration for the health, safety and living conditions of migrant workers in agriculture. *J Agromedicine*. 2010;15(1); In press.

Mills PK, Dodge J, Yang R. Cancer in Migrant and Seasonal Hired Farm Workers. *J Agromedicine*. 2009;14(2);185-191.

Minore B, Kati M, Hill ME. Planning Without Facts: Ontario's Aboriginal Health Information Challenge. *J Agromedicine*. 2009;14(2);90-96.

Myers ML, Cole HP. Simple Solutions for Reduced Fish Farm Hazards. *J Agromedicine*. 2009;14(2);150-156.

Pahwa P, Nakagawa K, Koehncke N, McDuffe HH. Effects of Polymorphic Variations in Tumor Necrosis Factor Alpha and Occupational Exposure to Grain Dust on Longitudinal Decline in Pulmonary Function. *J Agromedicine*. 2009;14(2);215-221.

Quendler E, Discus C, Pohl A, Buchegger T, Beranek E, Boxberger J. Child Safety Driver Assistant System and its Acceptance. *J Agromedicine*. 2009;14(2);82-89.

Stroink ML, Nelson CH. Aboriginal Health Learning in the Forest and Cultivated Gardens: Building a Nutritious and Sustainable Food System. *J Agromedicine*. 2009;14(2);263-269.

Stromquist AM, Merchant JA, Zwerling C, Burmeister LF, Sanderson WT, Kelly KM. Challenges of Conducting a Large Rural Prospective Population-Based Cohort Study: The Keokuk County Rural Health Study. J Agromedicine. 2009;14(2);142-149.

Whelan S, Ruane DJ, McNamara J, Kinsella A, McNamara A. Disability on Irish Farms – A Real Concern. J Agromedicine, 2009;14(2);157-163.

Wilson LD, Mohamed MH, Guo RU, Pratt DY, Kwon JH, Mahmud ST. Sorption of Agrochemical Model Compounds by Sorbent Materials Containing Q-Cyclodextrin. J Agromedicine. 2010;15(2); In press.

Publications: Other

In addition to published manuscripts, the articles relating to the "Prepare for Farm Safety" workshop and additional Low Stress Cattle Handling workshops have been circulated in the Network Newsletter that has a distribution to 28,000 Saskatchewan farm families through the Agricultural Health and Safety Network.

Inclusion of Gender and Minority Study Subjects

Symposium attendance was open to any individuals who registered for the event. Additionally, special effort was made to include international guests and students who expressed desire to attend but had economic constraints: Scholarships were given to several individuals, including an occupational safety scientist from Romania who was able to attend her third symposium in Saskatoon with much gratitude for travel support. There was no inclusion/exclusion criteria for attendance. No formal documentation of gender, race, or ethnicity was secured, thus, is not reported here. The conference hotels in which sessions were held were fully handicap accessible.

Materials Available for Other Investigators

The symposium "Program and Book of Abstracts" is available for anyone upon request. The published papers in journals are in the public domain. Any resources promoted during sessions or at exhibits would be the property of the author/producer of materials. There are no known materials that are not available for other investigators.

B) FINAL FINANCIAL STATUS REPORT FORMS — submitted under separate cover

C) FINAL INVENTION STATEMENT AND CERTIFICATION FORM — see separate form: NONE

Contacts

Barbara C. Lee, RN, PhD
Director, National Children's Center for Rural and Agricultural Health and Safety
1000 N. Oak Ave.
Marshfield, WI 54449 USA
715-387-9182
lee_barbara@Wmcrf.mfldclin.edu

John R. Gordon, PhD
Canadian Centre for Health & Safety in Agriculture
University of Saskatchewan
103 Hospital Dr., Box 120 RUH
Saskatoon, SK S7N 0W8 Canada
306-966-8292
john.oordon@usask.ca