# Swine Workers May Have Greater Risk for Influenza

Do farm workers who have contact with pigs risk developing a form of swine flu that can affect people as well as pigs? To find out, Dr. Gregory Gray at the University of Iowa conducted a two-year study of men and women who work with swine.

Study participants included more than 800 Iowa residents enrolled in the Agricultural Health Study, as well as individuals at the University of Iowa who served as representatives of the general population. All participants answered a questionnaire about health and farming activities and provided blood samples.

"Through laboratory tests," Dr. Gray explained, "we were able to determine whether participants had been exposed to swine flu by looking for tell-tale proteins called antibodies. Antibodies are produced by the body to defend against viruses, including swine flu virus."

The study found that participants who had contact with swine were 50 times more likely than the general population to have a high level of antibodies for the swine flu virus. In other words, they were more likely to have been exposed to the virus at some time in the past and to have their bodies' defenses activated to ward off the virus.

Spouses and other participants who lived or worked on a farm but reported no direct contact with pigs were 25 times more likely than the general population to have antibodies for the swine flu. This suggests that family members and other agricultural workers may be indirectly exposed to swine flu virus—perhaps by handling dirty laundry, occasionally entering a pig barn, or having close contact with people who work with swine.



On rare occasions, swine flu has been transmitted to humans. Often the disease in humans is mild or undiagnosed; occasionally, it can be quite serious and even deadly.

Because of the findings and recommendations from this study and others, the US Department of Health and Human Services recently added agricultural workers to the priority list for receiving vaccines in response to pandemic influenza threats.

## With Your Help

We hope that if you are asked to participate in an AHS add-on study, such as the swine flu study, you will say yes. If you have already participated in one or provided a buccal cell sample for AHS research, we appreciate your contribution very much!

The AHS is a long-term study to investigate the effects of environmental, occupational, dietary, and genetic factors on the health of the agricultural population. This study will provide information that agricultural workers can use in making decisions about their health and the health of their families.

The study is conducted in North Carolina by Battelle CPHRE and in Iowa by the Department of Epidemiology at the University of Iowa. The study is directed by the National Cancer Institute, the National Institute of Environmental Health Sciences, and the US Environmental Protection Agency.

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# Agricultural Health Study

Iowa
Study Update 2008

*The Agricultural Health Study seeks to identify factors that promote good health*

## AHS Scientists Begin Study of Lung Health

Agricultural Health Study (AHS) scientists have begun a large study of asthma and respiratory health among participants, including applicators and their spouses.

The Lung Health Study was developed because research shows that farmers and their families may be more likely than the general population to have asthma and other respiratory problems.

In the AHS, for example, farmers and commercial pesticide applicators who used specific pesticides or raised animals were more likely than others to report wheezing, which is a common symptom of asthma.

For women who grew up on farms, there are two interesting findings: 1) they report less asthma than women who didn't grow up on farms. 2) if they applied chemicals, they report more allergic asthma than others in the group.

"We hope to find out if specific pesticides contribute to asthma, as well as to evaluate the role of other farming exposures" said Dr. Jane Hoppin, the scientist who is leading this study.

The Lung Health Study will look at lung function, allergic status, and genetic characteristics associated with asthma and other respiratory illnesses.

"This study will give us better information about the onset of asthma and whether there are any associations with the use of pesticides," said Dr. Hoppin.

"If you are one of the 6,000 AHS participants we contact over the next four years, we hope you will agree to take part in the Lung Health Study."

**What is asthma?** Asthma is a serious chronic illness that causes inflammation of the airways and increased production of mucus in them. In addition to wheezing, symptoms include coughing and tightness in the chest.

## A Message from our Director

As I write this note, farmers in Iowa and North Carolina are struggling to rebound from major natural disasters in 2008. Many Agricultural Health Study participants have been impacted by unprecedented flooding in Iowa and severe drought in North Carolina.

On behalf of the entire AHS team, I would like to express our sincere concern for the welfare of the agricultural communities in both states. The economic loss and psychological impact of these events are undoubtedly great. Our thoughts and prayers are with you and your family as recovery is underway.

You are central to the success of our research. Without you, we would not be able to make new discoveries that may help to improve the health of future generations of farm families. Even if you are no longer farming, we appreciate your continued help.

We have now completed nearly 30,000 interviews to update information on health status and farming practices. Be assured that your confidentiality is always protected.

This newsletter will give you a glimpse of recent findings. For more information, please visit **www.aghealth.org** or call us at **1-800-217-1954**.

My sincere best wishes to you and your family,

Michael C.R. Alavanja, Dr PH
*Principal Investigator*
*Agricultural Health Study*
*National Institutes of Health*

# Study Measures Pesticide Residues in Homes

A study of homes of AHS participants in Iowa indicates that pesticide residues find their way into homes on the clothes and shoes of family members who work with the chemicals.

"This study suggests that families on farms where pesticides are used should take extra care in their routine cleaning efforts," said Dr. Brian Curwin, the scientist who conducted the study.

This is especially important if there are children in the home. Because their bodies are still developing, children are likely to be more susceptible than adults to any toxic effects of pesticides.

In the Iowa study, researchers collected dust samples on two occasions in 25 farm homes and 25 non-farm homes in two counties. In some cases, they visited the farm homes soon after pesticides had been applied and again four weeks later. On other occasions, pesticides had not been applied recently when samples were collected.

## Guide for Reducing Pesticide Exposures in the Home

- Remove work clothes in an area away from the rest of the house and wash them separately from other laundry.
- Remove work shoes and boots before entering the house.
- Vacuum carpets and clean floors on a regular basis.
- Close all windows and doors whenever pesticides are being sprayed nearby.
- Keep children and pets inside when pesticides are being applied outside.
- Strictly follow the instructions on pesticide labels regarding how long to wait before it's safe for adults or children to enter pesticide-treated areas.

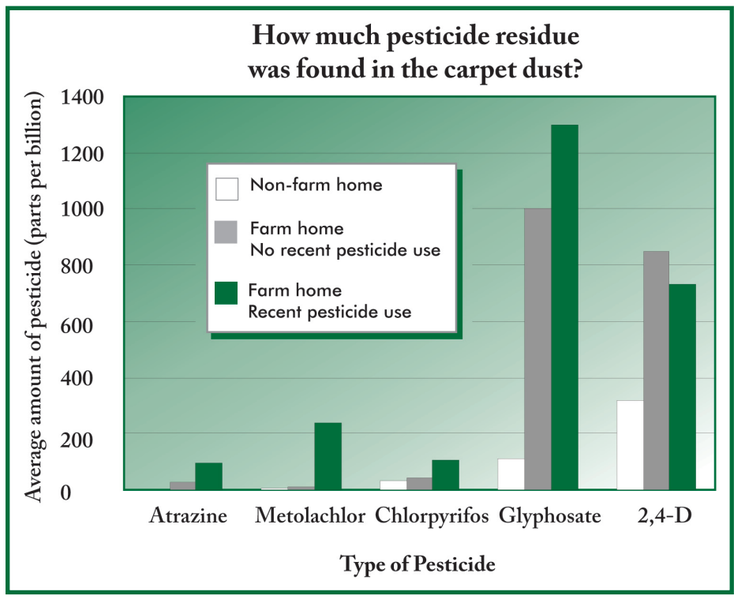
Dust samples were taken from carpets. Wipes were used to collect samples from hard surfaces in the kitchen, entranceway, laundry area, living room, children's playroom and children's bedroom.

Researchers tested for one common insecticide, chlorpyrifos, and six commonly used herbicides: atrazine; metolachlor; glyphosate; acetochlor; alachlor and 2,4-D.

"We found that farm homes had higher amounts of pesticide residues than non-farm homes," Dr. Curwin said.

On farms where atrazine and metolachlor had been applied to crops, higher amounts of these pesticides were found in rooms where dirt was tracked in or work clothes were left after the chemical was applied.

Glyphosate and 2,4-D, which are used in both residential and agricultural settings, were found in dust samples in most farm and non-farm homes. Chlorpyrifos, which has not been registered for residential use since 2000, was also found in dust samples.




## Stay in Touch

**As an AHS participant, you are contributing to an important study of the health of the agricultural community.**

**We appreciate your help over the years and want to stay in touch.**

**Please let us know of any changes in your address or phone number by calling 1-800-217-1954.**

**Thanks from all of us at the Iowa Field Station.**



# Some Pesticides May Increase Risk of Colorectal Cancer

Although farmers have a lower rate of colorectal cancer than the general population, research suggests a possible link between the disease and certain chemicals.

To learn more about this, AHS researchers decided to look for evidence of a link between colorectal cancer and exposures to agricultural pesticides.

Scientists compared information from 305 private applicators who were diagnosed with colorectal cancer during a seven-year period with information from those who did not develop the disease.

A few pesticides — including the insecticides chlorpyrifos and aldicarb — were associated with the risk of developing rectal or colon cancer.

The researchers were surprised by the evidence related to aldicarb because such a link had not previously been reported, according to Dr. Michael Alavanja, the principal investigator for AHS.

This is "new and unexpected," he said, adding that further study is needed to confirm the finding.

"Our results were based on a small number of cases. We will need to continue to evaluate this in the Agricultural Health Study before a firm conclusion about colon cancer and aldicarb exposure can be made," he added.

The finding related to chlorpyrifos was not entirely unexpected because a previous study of AHS users of the product also found an increased risk of rectal cancer.

"Additional analyses are planned," said Dr. Alavanja. "In the next two to three years we hope to be able to confirm if the findings for aldicarb and chlorpyrifos hold or if the results were due to statistical chance."

To protect your health, the National Cancer Institute suggests that you follow your doctor's recommendations for cancer screenings, such as a colonoscopy. These tests can detect precancerous changes or signs of cancer before any symptoms are observed, making prevention or early treatment possible.

# Pesticides May Increase the Risk of Diabetes

Research involving pesticide applicators in the AHS shows that exposure to some agricultural chemicals may increase the risk of diabetes, confirming the findings from earlier studies.

The study found a link between diabetes and seven pesticides: aldrin, chlordane, heptachlor, dichlorvos, trichlorfon, alachlor, and cyanazine. The strongest association with the disease was found for trichlorfon, although the number of applicators with heavy use was small.

Scientists with the National Institute of Environmental Health Sciences (NIEHS) analyzed data from nearly 1,200 participants in North Carolina and Iowa who developed diabetes after they enrolled in the long-term AHS study.

"The burden of diabetes is increasing around the world," said Dr. Dale Sandler, who oversaw the research at NIEHS. "We hope what we've found will inspire other scientists to pursue additional studies on this important issue."

Although three of the insecticides studied — chlordane, aldrin, and heptachlor — are no longer on the market, measurable levels of these and other pollutants are still detectable in the general population and in food products. These chemicals are organochlorines, as is dioxin, which has been shown to increase the risk of diabetes among Vietnam War veterans exposed to Agent Orange.

Participants who had used the herbicides alachlor and cyanazine had a higher risk for developing diabetes, particularly those participants who had used these chemicals repeatedly over their lifetime.

"Because few studies have looked at the association between herbicides and diabetes, more research is needed to confirm these findings," Dr. Sandler said.

As in other studies, AHS results confirmed the known link between obesity and diabetes. In fact, the strongest associations were found among overweight and obese participants. This may be because people with more body fat are more likely to store high levels of pollutants than people who are lean.