



Agricultural Health Study

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Wheeze

Wheeze is a whistling sound made during breathing, generally as a result of tightness in the chest. Although wheeze is a primary symptom of asthma, many people without asthma report wheeze as well.

Farming and Wheeze

Since the 1500s, it has been known that farmers have more respiratory disease and symptoms than other occupational groups. Farming has changed, and yet farmers continue to have higher rates of respiratory illnesses such as asthma, chronic bronchitis, and farmer's lung.

Even healthy farmers experience more wheeze, cough, and shortness of breath, than people who do not farm. These symptoms, most often caused by agents inhaled through the lungs, are not always symptoms of an underlying respiratory disease, but may be a temporary reaction to a respiratory irritant.

In the Agricultural Health Study...
1 out of 5 Report Wheeze

Of the 20,468 Agricultural Health Study participants who answered questions about wheeze, 3,800 reported at least one episode of wheeze in the farming season prior to filling out study forms.

Because the Agricultural Health Study is unique in size and in the broad range of information provided by participants, researchers can now study *for the first time* several factors that may contribute to wheeze among farmers: pesticide use, raising animals, and other farm exposures.

Working on a farm supports good health in a lot of ways, but it also exposes farmers to a range of respiratory hazards—dusts from soil and animal feed; poisonous substances produced by mold or bacteria; allergens such as pollen, grains, and hay; diesel exhaust; solvents; welding fumes; disinfectants used to clean animals and pens; and even naturally-produced ammonia and other compounds.

Exposures from Tractors

Farmers in the study who drove **diesel tractors** daily were 40% more likely to report wheeze than those who did not. Farmers who drove gasoline tractors reported less wheeze than those who used diesel tractors.

Research from the Agricultural Health Study indicates that diesel exhaust and solvents were the strongest risk factors for wheeze.

Other activities associated with increased wheeze included painting, cleaning with gasoline or other solvents, using solvents as pesticide additives, and smoking.



Animals

Findings from the Agricultural Health Study confirm that animals and animal-related exposures trigger wheeze among adult farmers.

Farmers who work with animals have higher rates of respiratory symptoms than other people living and working in rural areas.

Farmers who had direct contact with animals—for instance, milking cows, performing veterinary services, or butchering animals—reported more wheeze.



Poultry farmers, especially those with allergies, were more likely to report wheezing than farmers who work with hogs.

Similarly, farmers with a large number of animals on the farm were more likely to report wheeze. Poultry farmers with 500 or more birds and livestock farmers who had 1,000 or more animals *at any one time* had more wheeze than those with fewer animals.

The more frequent the contact with animals, and the longer the duration, the more likely the wheeze.

Even farmers who used natural fertilizer from animals (mainly manure) were more likely to have respiratory symptoms than other farmers.

Pesticides

While most pesticides used by participants in the Agricultural Health Study were not found to be associated with the respiratory symptom *wheeze*, some individual pesticides were:

- The insecticide *parathion* had the highest association with wheeze. Two other organophosphate insecticides (*chlorpyrifos* and *malathion*) were also associated with wheeze.
- The herbicides *paraquat*, *atrazine*, *alachlor*, *chlorimuron ethyl*, and *EPTC* were associated with wheeze, but 2,4-D was not.

Farmers who used these pesticides more often reported more wheeze.

Most application methods were associated with increased wheeze, but individuals applying pesticides to animals were the most likely to report wheeze.

Plans for Future Study

Agricultural Health Study researchers will continue studying respiratory toxicants on farms—particularly the organophosphate insecticides, diesel exhaust, and solvents—to learn more about how certain exposures may contribute to farmer's lung, adult asthma, chronic bronchitis and emphysema.

The Agricultural Health Study, directed by the National Cancer Institute, National Institute of Environmental Health Sciences, and the U.S. Environmental Protection Agency, is conducted in North Carolina and Iowa.

Background information and study findings, including the complete articles relating to wheeze, are available at the project website at www.aghealth.org.

The Agricultural Health Study 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 Centers for Public Health Research and Evaluation and in Iowa by the Department of Epidemiology at the University of Iowa. This study is directed by the National Cancer Institute, the National Institute of Environmental Health Sciences, and the US Environmental Protection Agency. Research results are being developed, peer reviewed, and made available to the scientific, medical, and agricultural communities.

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