



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

MAY 30 2007

MAY 29 2007

The Honorable Gene Taylor
House of Representatives
Washington, D.C. 20515-2404

Dear Mr. Taylor:

Thank you for your letter regarding the health problems reported by Mississippi and Louisiana residents concerning Federal Emergency Management Agency (FEMA) trailers in those states and your request that the Centers for Disease Control and Prevention (CDC) conduct a health investigation of formaldehyde exposure to people living in FEMA trailers. CDC shares your concern about those affected by Hurricane Katrina.

CDC and the National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR), in collaboration with the U.S. Environmental Protection Agency (EPA) and at the request of FEMA, have found levels of formaldehyde in closed trailers to cause irritation to the eyes, nose, and/or throat. For nonsensitized persons, symptoms are likely to be transient; however, long-term effects are not known. In addition to analyzing formaldehyde levels in closed FEMA trailers, NCEH/ATSDR is providing support to Mississippi and Louisiana State Health Departments to conduct epidemiologic studies on exposures from the trailers.

CDC recognizes that residents experiencing symptoms want and need to alleviate their discomfort. They can do so by reducing their total exposure to formaldehyde. Residents can protect themselves by increasing the exchange rate of indoor air with fresh outdoor air in their homes (i.e., keeping their windows open or operating their air conditioners in an exhaust mode as opposed to a circulate mode). They can also avoid certain products and activities likely to increase formaldehyde levels. For instance, they can avoid using products that contain formaldehyde such as dry cleaning fluids and some household cleaners, paints, varnishes, and vinyls. They can also avoid cigarette smoke which is known to contain formaldehyde. In addition, residents should avoid using kerosene heaters which can increase formaldehyde levels. Furthermore, wood products such as plywood and particle board should be sealed with vinyl paint that does not contain formaldehyde.

CDC has contacted FEMA, EPA, the Department of Housing and Urban Development (HUD), and the Department of Transportation (DOT) regarding your request. EPA is responsible for regulating formaldehyde as a hazardous air pollutant. HUD is responsible for regulating formaldehyde levels in manufactured housing and other prefabricated dwellings, excluding travel trailers. DOT is responsible for regulating mobile homes under 49 CFR, Part 571, "Federal Motor Vehicle Safety Standard."

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Enclosed is supplemental scientific-related information about formaldehyde (Tab A). This information is provided to demonstrate the state of our science regarding this issue. An ATSDR fact sheet which answers frequently asked questions about formaldehyde exposure is also enclosed (Tab B). For more information about the health effects of formaldehyde exposure, please access ATSDR's Toxicological Profile for formaldehyde at www.atsdr.cdc.gov/toxprofiles/tp111.html.

Formaldehyde is just one of many factors to consider related to health in the home. CDC has two related initiatives that may also be of interest to you. These initiatives focus on building healthy communities and healthy homes. Our staff members will be pleased to discuss these initiatives in greater detail upon your request.

I appreciate the opportunity to address this important public health issue and hope this information is helpful.

Sincerely,

A handwritten signature in black ink, appearing to read "Julie Louise Gerberding". The signature is written in a cursive style with a large initial "J".

Julie Louise Gerberding, M.D., M.P.H.
Director, Centers for Disease Control and
Prevention, and
Administrator, Agency for Toxic Substances and
Disease Registry

2 Enclosures

Tab A: CDC/ATSDR Science-Related Summary of Findings on Formaldehyde

Background on Formaldehyde

Formaldehyde is a colorless gas with a pungent, irritating odor. An odor threshold is reported as 0.83 ppm with a range of 0.05 to 1.0 ppm (ACGIH, 2001). Some studies of people exposed to formaldehyde in workplace air found more cases of cancer of the nose and throat than expected, but other studies did not confirm this finding. Nonetheless, the Department of Health and Human Services (HHS) has determined that formaldehyde may reasonably be anticipated to be a human carcinogen on the basis of limited evidence in humans and sufficient evidence in laboratory animals (NTP, 2005). The U. S. Environmental Protection Agency (EPA) and the International Agency for Research on Cancer also classify formaldehyde as a probable human carcinogen.

Adverse Health Effects of Intermediate Exposure to Formaldehyde

Table 1: Acute Adverse Health Effects from the Inhalation of Formaldehyde

Exposure Level (ppm)	Reported Adverse Effects
0.05—1.0	50—70% of people tested report no effects
0.05—1.0	Odor threshold
0.05—2.0	Eye irritation
0.10—25	Upper airway irritation
5.0—30	Lower airway and pulmonary effects
50—100	Pulmonary edema, inflammation, pneumonia
>100	Death

From National Research Council, Committee on Aldehydes: Formaldehydes and Other Aldehydes. 1981, National Academy Press, Washington D.C.

Inhalation exposure of months to one year or longer is expected to increase the incidence of symptoms of upper respiratory tract and eye irritation (ATSDR, 1999).

Formaldehyde is found in low levels in homes, offices, and the urban environments. Mobile homes are a potential source of relatively high formaldehyde exposures because they are typically constructed of large quantities of particle board bonded with formaldehyde resins. Mobile homes also have lower outdoor air exchange rates than conventionally built housing which leads to an accumulation of free formaldehyde in living spaces (Stenton, 1994). Ritchie and Lehnen conducted a study of 2000 individuals living in mobile and conventional homes and

found that occupants complained of nose and throat irritation, headache, and rashes at exposures of ≥ 0.1 ppm (Ritchie, 1987). Further information on the health effects of formaldehyde exposure can be found in the Toxicological Profile for formaldehyde available at www.atsdr.cdc.gov/toxprofiles/tp111.html.

Levels of Formaldehyde in "worst case" Unoccupied, Closed Trailers

CDC and ATSDR, in collaboration with EPA and at the request of the Federal Emergency Management Association (FEMA), have reviewed the formaldehyde levels from tests of 96 unoccupied FEMA emergency-housing trailers. The available data suggest that in closed trailers, the average formaldehyde level of 1.1 ppm dropped to below 0.14 ppm when maximum ventilation was used, including opening windows and running exhaust fans. However, in trailers where ventilation was provided by running the air conditioners with only the bathroom vents open, the formaldehyde levels, on average, were reduced to 0.4 ppm. This level may be high enough to cause symptoms in people who have already become "sensitized" to formaldehyde. Although formaldehyde levels in new trailers may remain above the threshold for symptoms in sensitized people for as long as three years, nonsensitized people are unlikely to experience anything other than transient irritation. However, the long term health effects of formaldehyde exposure cannot be determined from this analysis.

References:

Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological profile for Formaldehyde. Research Triangle Institute. 1999.

American Conference of Governmental Industrial Hygienists (ACGIH). Formaldehyde: TLV[®] Chemical Substances 7th Edition. Cincinnati, Ohio 2001.

Ritchie IM and Lehnen RG. Formaldehyde-related complaints of residents living in mobile and conventional homes. American Journal of Public Health. 1987; 77:323-328.

Stenton SC and Hendrick DJ. Formaldehyde. Immunology and Allergy Clinics of North America. 1994; 3:635-657.

U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program (NTP). Report on Carcinogens, 11th Edition. 2005.

Tab B: ATSDR Fact Sheet "ToxFAQs™" for Formaldehyde



FORMALDEHYDE

CAS # 50-00-0

Agency for Toxic Substances and Disease Registry ToxFAQs

June 1999

This fact sheet answers the most frequently asked health questions (FAQs) about formaldehyde. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Everyone is exposed to small amounts of formaldehyde in air and some foods and products. Formaldehyde can cause irritation of the skin, eyes, nose, and throat. High levels of exposure may cause some types of cancers. This substance has been found in at least 26 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is formaldehyde?

(Pronounced för-mäl/do-hīd')

At room temperature, formaldehyde is a colorless, flammable gas that has a distinct, pungent smell. It is also known as methanal, methylene oxide, oxymethylene, methylaldehyde, and oxomethane. Formaldehyde is naturally produced in small amounts in our bodies.

It is used in the production of fertilizer, paper, plywood, and urea-formaldehyde resins. It is also used as a preservative in some foods and in many products used around the house, such as antiseptics, medicines, and cosmetics.

What happens to formaldehyde when it enters the environment?

- Formaldehyde dissolves easily but does not last a long time in water.
- Most formaldehyde in the air breaks down during the day.
- The breakdown products of formaldehyde are formic acid and carbon monoxide.
- Formaldehyde does not build up in plants and animals.

How might I be exposed to formaldehyde?

- Smog is a major source of formaldehyde exposure.
- Cigarettes and other tobacco products, gas cookers, and open fireplaces are sources of formaldehyde exposure.
- It is used in many industries and in hospitals and laboratories.
- Formaldehyde is given off as a gas from the manufactured wood products used in new mobile homes.
- The amount of formaldehyde in foods is very small.
- Household sources, such as fiberglass, carpets, permanent press fabrics, paper products, and some household cleaners.

How can formaldehyde affect my health?

Low levels of formaldehyde can cause irritation of the eyes, nose, throat, and skin. It is possible that people with asthma may be more sensitive to the effects of inhaled formaldehyde.

Drinking large amounts of formaldehyde can cause severe pain, vomiting, coma, and possible death.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

How likely is formaldehyde to cause cancer?

Some studies of people exposed to formaldehyde in workplace air found more cases of cancer of the nose and throat than expected, but other studies did not confirm this finding.

In animal studies, rats exposed to high levels of formaldehyde in air developed nose cancer. The Department of Health and Human Services (DHHS) has determined that formaldehyde may reasonably be anticipated to be a carcinogen.

How can formaldehyde affect children?

The most common route of exposure is by breathing it, which is likely to cause nose and eye irritation (burning, itchy, tearing, and sore throat) in children as well as in adults.

Animal studies suggest that formaldehyde will not cause birth defects in humans. It is not likely to be transferred to a child in breast milk.

How can families reduce the risk of exposure to formaldehyde?

Formaldehyde is usually found in the air, and levels are usually higher indoors than outdoors. Opening windows and using fans to bring fresh air indoors are the easiest ways to lower levels in the house. Not smoking and not using unvented heaters indoors can lower the formaldehyde levels.

Removing formaldehyde sources in the home can reduce exposure. Formaldehyde is given off from a number of products used in the home. Providing fresh air, sealing unfinished manufactured wood surfaces, and washing new permanent press clothing before wearing can help lower exposure.

Is there a medical test to show whether I've been exposed to formaldehyde?

Laboratory tests can measure formaldehyde in blood, urine, and breath. These tests do not tell you how much formaldehyde you have been exposed to or if harmful effects will occur. The tests are not routinely available at your doctor's office.

What recommendations has the federal government made to protect human health?

The EPA recommends that an adult should not drink water containing more than 1 milligram of formaldehyde per liter of water (1 mg/L) for a lifetime exposure, and a child should not drink water containing more than 10 mg/L for 1 day or 5 mg/L for 10 days.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit for formaldehyde of 0.75 parts per million (ppm) for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends an exposure limit of 0.016 ppm.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for formaldehyde. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



SENT BY: ATSDR WASH. DC OFFICE ; 2-23- 7 :10:19AM ; CDC WASHINGTON OFC. -

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February 22, 2007

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Julie Louise Gerberding, M.D., M.P.H.
Director
Centers for Disease Control
1600 Clifton Road, N.E.
Atlanta, GA 30333

Dear Dr. Gerberding:

Enclosed please find a copy of an article in the February 26 issue of *The Nation*, entitled "Toxic Trailers," as reprinted in the (Biloxi) *Sun Herald*.

The article describes respiratory illness and other health problems suffered by residents of FEMA trailers in Mississippi and Louisiana. Several health experts expressed the opinion that formaldehyde emissions from the wood products in the trailers are responsible for the illness among trailer residents.

I urge you to initiate a detailed investigation by the Centers for Disease Control. According to the article, FEMA, OSHA, EPA, and the Mississippi Department of Health have looked into the concerns, but each questions its authority to conduct a substantive investigation. CDC should be the appropriate agency to fully investigate whether formaldehyde in the FEMA trailers has caused an outbreak of respiratory illness.

If you need any action by Congress or by the affected states, please let me know immediately and I will do all I can to make it happen.

Thank you for your immediate attention to this request. If you have any questions, please contact Brian Martin in my office at (202) 225-5772.

Sincerely,


GENE TAYLOR
Member of Congress

GT:jbm