

# Diacetyl (Butter Flavor Chemical) Use in Flavoring Manufacturing Companies

**Exposure to diacetyl used in flavoring manufacturing companies may cause a serious lung disease called bronchiolitis obliterans.** Workers from two California flavoring companies that use diacetyl have been diagnosed with this disease. Damage to the lungs can be permanent, can require a lung transplant, and can lead to death. The main symptoms are a persistent cough and shortness of breath when using extra energy (such as walking fast or up a slight hill) and wheezing when you do not have a cold. The symptoms do not go away in the evenings, on weekends, and on vacations. They can start gradually and get worse over time, or they can suddenly be very severe. Doctors sometimes think the symptoms are due to asthma, chronic bronchitis, emphysema, pneumonia, or smoking. If you work at a flavoring company that uses diacetyl, see a doctor immediately to make sure that your health is not being affected. Take this information sheet with you. Your company should follow the recommendations on page 2 to reduce exposure to diacetyl and other flavoring chemicals.

Health  
Hazard  
ALERT

## How to know if you are working with diacetyl

Diacetyl is a yellowish liquid that is usually mixed with other ingredients to produce butter flavor or other flavors in a variety of food products. If you think diacetyl is used in your workplace, read labels on containers and ask to see a Material Safety Data Sheet (MSDS). The MSDS must list diacetyl in Section 2 by the Chemical Abstract Service (CAS) number 431-03-8. Cal/OSHA's Hazard Communication Standard (Title 8, Section 5194), requires your employer to tell you if you are using diacetyl, and to train you on the health hazards and how to use it safely.

## How you are exposed to diacetyl

Diacetyl enters your body when you breathe vapors, droplets of spray, or dust containing diacetyl in the air.

Your risk of health effects depends on how much diacetyl enters your body. The amount of diacetyl in the air and how long you are exposed, determines how much enters your body.

## How diacetyl can affect your health

**Lungs.** Diacetyl can damage your lungs. Symptoms include a dry cough, shortness of breath when using extra energy, and wheezing. The symptoms can start gradually, or severe symptoms can occur suddenly. The symptoms continue when you are not at work. Asthma medicines are not effective. Some workers do not have symptoms. See Medical Tests (page 2). Diacetyl damages the respiratory system of test animals.

**Eyes, nose, and throat.** Diacetyl vapors can sting or burn your eyes. They can cause your nose and throat to burn and feel sore. Eye contact with vapors can also cause chemical burns which require medical treatment to heal.

**Skin.** Diacetyl can irritate the skin. It can cause a rash with dryness, redness, flaking, and cracking of the skin.

**Cancer and reproductive effects.** Diacetyl has not been tested for these effects. Reducing exposure (page 2) to prevent lung disease will help to protect you.



**HAZARD EVALUATION SYSTEM & INFORMATION SERVICE**  
Occupational Health Branch  
California Department of Health Services  
850 Marina Bay Parkway, Building P, Third Floor, Richmond, CA 94804  
866-282-5516 • [www.dhs.ca.gov/ohb](http://www.dhs.ca.gov/ohb)

# Medical tests for health effects

Breathing tests (spirometry) that measure how well your lungs are working, and a respiratory symptom questionnaire, are the best ways to detect bronchiolitis obliterans and other serious lung disease. Early detection is critical. You should have a lung function test before you begin working in a company that uses diacetyl and on a regular basis while you are working.

# How to reduce exposure to diacetyl

**Substitution.** Less hazardous flavoring ingredients should be used whenever possible. Make sure that substitutes are safe.

**Closed production processes.** Handling open containers of diacetyl and other flavoring ingredients should be avoided.

**Ventilation.** Maintain air levels of diacetyl as low as possible using local exhaust ventilation. A safe exposure level has not been identified.

**Respiratory protection.** Respirators should be used until ventilation and other controls are determined to be effective. Use NIOSH-approved air-purifying respirators with organic vapor cartridges and particulate filters, or supplied-air respirators. Employers must comply with the Cal/OSHA Respiratory Protection Standard (Title 8, Section 5144). See

[www.dir.ca.gov/title8/5144.html](http://www.dir.ca.gov/title8/5144.html)

**Skin and eye protection.** Employers must provide protective gloves, goggles, and other protective equipment.

## WHERE TO GET HELP

- ▶ **HESIS** can answer questions about diacetyl, other workplace hazards, and information in this fact sheet. Call **(866) 282-5516**.
- ▶ **California Division of Occupational Safety and Health (Cal/OSHA)** investigates workers' complaints and makes enforcement inspections. Complainants' identities are kept confidential. Call the nearest office to your workplace, or see [www.dir.ca.gov/DOSH/districtoffices.htm](http://www.dir.ca.gov/DOSH/districtoffices.htm)
- ▶ **Cal/OSHA Consultation Service** helps employers who want free, non-enforcement help to evaluate the workplace and improve health and safety conditions. Flavoring companies can call **(562) 944-9366**.
- ▶ **National Institute for Occupational Safety and Health (NIOSH)**. See [www.cdc.gov/niosh/topics/flavorings/](http://www.cdc.gov/niosh/topics/flavorings/)
- ▶ **Occupational health services can be found at:**
  - University of California (UC)  
San Francisco: **(415) 885-7580**
  - UC Davis: **(530) 754-7635**
  - UC Irvine: **(949) 824-8641**
  - UC San Diego: **(619) 471-9210**
  - UCLA: **(310) 794-8144**

- ▶ **Flavor and Extract Manufacturers Association of the United States (FEMA)**. See [www.femaflavor.org/html/public/RespiratoryRpt.pdf](http://www.femaflavor.org/html/public/RespiratoryRpt.pdf)

## REGULATIONS THAT HELP TO PROTECT WORKERS

- ▶ **Injury and Illness Prevention Program.** See [www.dir.ca.gov/title8/3203.html](http://www.dir.ca.gov/title8/3203.html)
- ▶ **Hazard Communication.** See [www.dir.ca.gov/title8/5194.html](http://www.dir.ca.gov/title8/5194.html)
- ▶ **Control of Harmful Exposures to Employees.** See [www.dir.ca.gov/title8/5141.html](http://www.dir.ca.gov/title8/5141.html)
- ▶ **Access to Employee Exposure and Medical Records.** See [www.dir.ca.gov/title8/3204.html](http://www.dir.ca.gov/title8/3204.html)



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