To The Point
Flavorings

CHUBB®

Controlling Flavoring-related Illness

Flavorings are mixtures of many man-made and natural substances. The U.S. Food and Drug Administration determines which food ingredients are Generally Recognized As Safe (GRAS) to eat. GRAS ingredients may still pose workplace inhalation and skin contact hazards. Limited research has been conducted on potential workplace hazards posed by food ingredients and thus few regulations exist.

Clusters of occupational lung disease cases were identified at microwave popcorn plants and flavoring manufacturers between 2000 and 2006. Disease has been potentially linked to the use of diacetyl, an artificial butter flavoring. Also, more than 50 products liability law suits have been filed against artificial butter flavoring manufacturers. A handful of consumer suits have been filed against the microwave popcorn industry, flavorings manufacturers and grocery stores, as well.

The diacetyl content of flavorings is typically very small, ranging from hundredths of a percent to 5% by weight. While OSHA focuses on diacetyl content greater than 1% in flavors, litigation has involved flavorings with appreciably less. Diacetyl is present in many flavorings, not just artificial butter flavorings, so all should be considered. Most microwave popcorn manufacturers have already substituted a nondiacetyl flavoring.

Identifying Exposure

Safety Data Sheets (SDSs) provide a medium for manufacturers to alert chemical users to hazards and recommended control measures. The U.S. Occupational Safety & Health Administration (OSHA) has issued advice on preparation of flavoring SDSs and warning labels. They reviewed both and found that updated diacetyl health effects and worker protection information is routinely not included. Significant new information regarding the health effects of diacetyl and food flavorings

containing diacetyl must be conveyed to employers and employees under OSHA's Hazard Communication standard. Hazard Communication Guidance for Diacetyl and Food Flavorings Containing Diacetyl is available from OSHA. Flavoring manufacturers should be contacted to provide this information.

The U.S. National Institute for Occupational Safety & Health (NIOSH) states that "current evidence points to diacetyl as one agent that can cause flavorings-related lung disease. Other flavoring ingredients may also play a role. "Flavorings may be inhaled during processing due to evaporation or dust generation from ingredient handling. Heating, mixing, and spraying operations increase air concentrations. Greater air contaminant escape occurs through open top and unventilated tanks. The most severe disease has been linked to work conducted in mixing areas. Disease develops within months to years depending upon the extent of exposure.

Flavoring-related disease has occurred primarily at flavoring and microwave popcorn manufacturing facilities. NIOSH has identified other food industries with potentially similar flavoring chemical exposure including manufacturers of snack foods, bakery mixes, margarine and other vegetable oil-based cooking products, butter and other dairy products, and candy. Recently, chef use of liquid and spray butterflavored cooking oil products and margarine has been identified as a potential concern. Flavoring and microwave popcorn manufacturing have been linked to severe lung disease in some workers, but the extent of risk to workers in other industries is not known. Beyond foods, flavoring chemicals may also be used in scented products.

Types of Injuries

Flavorings in the workplace can irritate eyes, lungs, and skin. Respiratory injuries have ranged from mild inflammation to lung restriction and obstruction. Bronchiolitis obliterans, an irreversible severe form of lung scarring and obstruction, has led to placement of a small number of workers on the lung transplant list. Skin irritation, dryness, and cracking have also been reported.

The consumer suits arose from plaintiffs alleging lung disease from the inhalation of buttery vapors while consuming two to six bags of microwave popcorn a day for several years.

Preventing Injuries

Substitution of a less hazardous material, if available, can be an effective means of exposure reduction. Substitutes have been implemented by most major microwave popcorn plants and are likely available for similar operations.

Engineering & Administrative Controls have been recommended by NIOSH and the Flavor and Extract Manufacturers Association. These measures include:

- Closed processes
- Isolation of mixing room
- Local or general ventilation
- Lowest possible temperatures
- Good housekeeping
- Restricted access
- Respiratory protection
- Protective clothing
- Training

Medical Management strategies recommended by NIOSH include pre-placement and medical evaluations and spirometry testing of lung function at least annually. Testing frequency should be increased if abnormalities are found. Employees with persistent irritation or breathing problems should be referred for further medical evaluation.

Resources

Flavor and Extract Manufacturers Association: Respiratory Health and Safety in the Flavor Manufacturing Workplace - 2012 Update
www.femaflavor.org/respiratory-health-and-safety-flavor-manufacturing-workplace-2012-update

NIOSH: Flavorings-Related Lung Disease
www.cdc.gov/niosh/topics/flavorings/

NIOSH: Preventing Lung Disease in Workers Who Use or Make Flavorings
www.cdc.gov/niosh/docs/2004-110/

OSHA: Flavorints-Related Lung Disease
ww.osha.gov/SLTC/flavoringlung/diacetyl.html

OSHA: Occupational Exposure to Flavoring Substances: Health Effects and Hazard Control
www.osha.gov/dts/shib/shib10142010.html

OSHA: Worker Alert - Diacetyl and Substitutes
www.osha.gov/SLTC/flavoringlung/diacetyl_worker_alert.pdf

Learn More & Connect

For more information on protecting your business, contact your local risk engineer, visit the Chubb Risk Consulting Library, or check out www.chubb.com/riskconsulting.