

## Exposure to Diacetyl (Butter Flavoring)

In recent years, diacetyl, the butter flavoring used in popcorn, has been associated with the debilitating lung disease, bronchiolitis obliterans. Attention has largely focused on flavoring manufacturers and workers exposed to flavorings at microwave popcorn plants because of the known incidence of the disease and the higher exposure to diacetyl in these environments. Guidelines for safe use of this flavoring are outlined in this bulletin.

While diacetyl has been associated with microwave popcorn, lower levels are found in a wide variety of products in the food processing sector. These exposures are lower, and there is currently no evidence of diacetyl-related evidence in these industries. Research is being done to identify the extent of exposure. It is important to distinguish the effects caused by inhalation of diacetyl during manufacturing or processing from ingestion of foods containing the flavorings. Ingestion of foods containing diacetyl is considered safe.

Flavorings containing diacetyl are commonly used in the production of margarine and butter-flavored oils and cooking sprays, in retail and commercial bakeries, the production of some snack foods (particularly those with cheese flavoring), and in many confectionaries. Dairy, butter, and cheese flavors are sometimes used in frozen foods, canned foods, salad dressings, cheese and dairy substitutes, flavored wines and liquors, pet food, and specialty preparations. Fruit flavorings containing diacetyl are used in some yogurt and ice cream products.

Although diacetyl is frequently an additive in manufactured food flavorings, it can also occur naturally in foods. Diacetyl is a naturally occurring byproduct of the fermentation process. It is present in the manufacture of wines, especially chardonnay, where it both occurs naturally and is a component of various flavorings added. The same occurs in breweries, and the addition of heat in the process adds

to the exposure. If employee exposure were to occur, it would be during addition of flavorings, pumping liquid from tanks, or cleaning tanks.

Several government agencies are involved in research and evaluation of the extent of risk to employees, and California is the first state to officially regulate employee exposure to diacetyl. While they are regulations in California, these requirements are considered "best practices" in other states, and outline steps to reduce exposure to the lowest levels feasible. The regulations apply to processes using diacetyl at 1% or more by weight, or where an employee has been diagnosed with bronchiolitis obliterans. Guidelines for control of diacetyl include:

- Exposure assessments to determine concentrations of exposure.
- Establishment of regulated areas, separated from the rest of the workplace
- Engineering and work practices to reduce exposure to the lowest levels feasible. Dry sweeping or use of compressed air for cleaning is prohibited.
- Respiratory protection for employees working in regulated areas
- Medical surveillance for employees who report symptoms or are in an area of uncontrolled release
- Medical removal at the physician or licensed practitioner's request
- Awareness training for all employees and additional training for exposed employees
- Labeling of products containing diacetyl

- Reporting diagnosed cases of fixed obstructive lung disease.

Although the amounts of diacetyl used by policyholders may be small, policyholders are likely to know the concentrations, as diacetyl is a desired byproduct or addition. They should also be aware of the practices above. We will continue to monitor developments concerning diacetyl and bronchiolitis obliterans, and keep you informed. For additional information or assistance, contact your Zenith Safety and Health Consultant.

Zenith provides workplace safety resources at: **TheZenith.com**<sup>®</sup>

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