Butter Flavoring and Lung Cancer

Reston, VA (March 2, 2010)—Microwave popcorn is a popular snack food, but workers who make this flavorings and microwave popcorn can develop an obstructive lung disease known as Popcorn Workers' Lung or Flavored-Associated Lung Disease. A 2009 animal study on diacetyl, a 4-carbon α-diketone flavoring that produces the flavor of butter in many compounds, including butter itself, showed that exposure to diacetyl can be harmful to the nose and airways of mice. On March 10, 2010 Dr. Ann Hubbs, of the National Institute of Occupational, Safety and Health (NIOSH), will be on hand to talk about the latest research findings at the Society of Toxicology Annual Meeting and Tox Expo™, which is being held March 7–11, 2010 at the Salt Palace Convention Center in Salt Lake City, Utah.

In 2002, NIOSH researchers demonstrated that inhaled butter flavoring vapors damaged the airway epithelium. This was an important finding because airway epithelial damage in small airways is believed to cause bronchiolitis obliterans. In 2008, NIOSH researchers demonstrated similar changes in the airways of rats inhaling diacetyl. In 2008, the National Institute of Environmental Health Sciences, working in collaboration with researchers at Duke University, completed a study that showed that exposure to diacetyl can be harmful to the nose and airways of mice. Mice were exposed to diacetyl at concentrations and durations comparable to what may be inhaled at some microwave popcorn packaging plants. A 2009 study developed a model that predicated that the deep lung of workers actually received a higher dose than the deep lung of rats at a given ambient concentration of diacetyl.

Flavorings are composed of various natural and manmade substances. They may consist of a single substance, but more often they are a complex mixture of several substances. Most chemicals used in flavorings have not been tested for respiratory toxicity *via* the inhalation route, and occupational exposure limits have been established for only a small number of these chemicals.

In NIOSH workplace evaluations, case clusters of fixed obstructive lung disease have been documented among workers where flavorings are used or produced. Recent attention has largely focused on workers exposed to volatile chemicals in butter flavorings at microwave popcorn plants, but other reports indicate that other flavoring and food manufacturing workers exposed to various flavorings may be at risk. The severe lung disease seen in workers making a popular snack food and the toxicity of something as common as butter flavoring, have long captured public attention. The NIOSH research is expected to result in regulatory changes with the inclusion of diacetyl and diacetyl-related flavorings on this year's agenda for the Occupational Safety and Health Administration (OSHA).

The Society of Toxicology is a scientific not-for-profit organization for professionals from around the world who are involved in the study of toxicology. With more than 6,000 members, the Society is creating a safer and healthier world by advancing the science of toxicology. SOT is a forum for novel discoveries and approaches related to toxicology, fosters integration of sub-disciplines that support the evolution of toxicology, and, among other things, increases the impact of toxicology on human health and disease prevention.

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Editors Note: To see the entire program or arrange to attend a session, reporters are invited to visit, "Just for the Media" at the Annual Meeting site at http://www.toxicology.org/AI/MEET/AM2010/. Reporters may also contact Martha Lindauer at (703) 505-3351 (cell) or (703) 438-3115.