

Science of Odor as a Potential Health Issue

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ABSTRACT

Historically, unpleasant odors have been considered warning signs or indicators of potential risks to human health but not necessarily direct triggers of health effects. However, citizen complaints to public health agencies suggest that odors may not simply serve as a warning of potential risks but that odor sensations themselves may cause health symptoms. Malodors emitted from large animal production facilities and wastewater treatment plants, for example, elicit complaints of eye, nose, and throat irritation, headache, nausea, diarrhea, hoarseness, sore throat, cough, chest tightness, nasal congestion, palpitations, shortness of breath, stress, drowsiness, and alterations in mood. There are at least three mechanisms by which ambient odors may produce health symptoms. First, symptoms can be induced by exposure to odorants (compounds with odor properties) at levels that also cause irritation or other toxicological effects. That is, irritation—rather than the odor—is the cause of the health symptoms, and odor (the sensation) simply serves as an exposure marker. Second, health symptoms from odorants at nonirritant concentrations can be due to innate (genetically coded) or learned aversions. Third, symptoms may be due to a copollutant (such as endotoxin) that is part of an odorant mixture. Objective biomarkers of health symptoms must be obtained, however, to determine if health complaints constitute health effects. One industry that is receiving much attention, worldwide, related to this subject is concentrated animal production agriculture. Sustainability of this industry will likely necessitate the development of new technologies to mitigate odorous aerial emissions. Examples of such “environmentally superior technologies” (EST) developed under the initiative sponsored through agreements between the Attorney General of North Carolina and Smithfield Foods and Premium Standard Farms are described.

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