

JEANNE YTURRI

## The Food Industry Faces Environmental Challenges

Food research and development, manufacturing, warehousing, distribution, and retailing each involve activities that can have a negative impact on the environment. Food scientists need to be aware that these activities routinely trigger a myriad of local, state, and federal regulations that must be addressed to protect the environment. Compliance with these requirements can consume significant resources and greatly affect operations and business continuity.

**R&D.** Food laboratories must address chemical storage and handling, hazard communication, and regulatory reporting requirements. The applicability of certain exemptions for laboratory equipment, discharging certain materials via sanitary sewer, or emitting small volumes of chemicals should be determined and documented.

**Manufacturing.** Food manufacturing results in air emissions, wastewater discharges, the potential for spills, and the generation of waste materials. Most food ingredients and products, such as milk, fruit and vegetable juices, sugar, eggs, etc., are considered pollutants when discharged in large volumes of wastewater. Certain chemicals, primarily acids and detergents, used in R&D and for cleaning equipment and vehicles can pose a threat to the environment if they are handled, stored, or discharged improperly. Ovens, boilers, and engines emit oxides of nitrogen and other combustion products that contribute to smog and global warming. Packaging waste, unusable product, and scrap materials and equipment contribute to landfills and other waste disposal facilities.

The Environmental Protection Agency and most state and local regulatory agencies require food manufacturers to obtain permits to authorize specific activities that have potential impact on the environment. Air permits or other forms of regulatory authorization must be obtained and ongoing compliance ensured for combustion sources such as ovens, particulate-emission sources such as flour silos, and sources of air emissions from cleaning and maintenance operations.

**Wastewater Treatment.** Local wastewater treatment plants typically require all manufacturing facilities to obtain a permit to discharge process wastewater, even if food ingredients are all that is discharged. Periodic monitoring and reporting must be routinely conducted to demonstrate compliance with discharge requirements. Under the federal storm water pollution prevention regulations, EPA and/or the state regulatory agency can require specific practices to protect rain water from becoming contaminated by construction or industrial activities before it leaves a facility. Regulated activities include outdoor storage of materials, loading and unloading opera-

tions, trash and waste management areas and equipment, and chemical handling and storage operations.

**Warehousing.** The abundant use of forklifts and pallet jacks that use lead-acid batteries or propane for fuel pose a significant risk to the environment if mishandled. A refrigerated or frozen food warehouse is typically chilled by an ammonia system, and stringent operational and permitting requirements apply to ensure that this toxic gas is not accidentally released to the environment. Dirty wastewater from floor scrubbers is typically discharged to a sump wash bay in the warehouse, which must be periodically inspected and monitored. Prompt cleanup and proper disposal of spilled materials are also necessary.

**Distribution.** A number of food companies own and operate vehicles to transport and distribute their products, and the environmental impacts posed by fleet operations and maintenance activities can be significant. Truck washing, fueling, tire changing, and engine and body repair involve the use of oils, fuels, and flammable and corrosive chemicals, generate wastewater and waste materials, and create the potential for spills. The environmental requirements associated with these activities are significant and costly.

**Retailing.** Food retailing also poses some environmental challenges, primarily due to construction and repair activities, waste and scrap generation, and the potential for spills. Even environmental impacts caused by a customer, such as product breakage or car fluid release, become the retailer's problem to address.

Environmental awareness and stewardship initiatives are here to stay, and will only increase in importance to both regulators and the public. In addition, a heightened concern for food safety and security is an issue. Predictions for the future include increased recycling capabilities and product take-back programs, alternative "environmentally friendly" fuels for transportation, and more-efficient generation of electricity, e.g., from micro turbines and fuel cells. It is important for food scientists to know what environmental impacts their activities pose and what regulatory requirements may apply so that they can be addressed properly. One good place to start is the "EPA Regions & State Environmental Departments" Web site at [www.epa.gov/epapages/statelocal/envrolst.htm](http://www.epa.gov/epapages/statelocal/envrolst.htm). ●

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*Jeanne Yturri is a Principal with Zephyr Environmental Corp., 1515 Capital of Texas Hwy., Suite 300, Austin, TX 78746.*