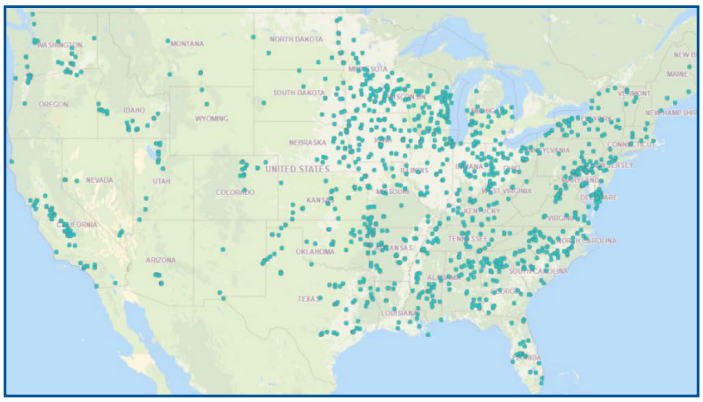
Food and Beverage Manufacturing and Processing

P2 National Emphasis Area (FY22-23)
P2-TRI Fact Sheet

EPA adopted six national emphasis areas (NEAs) for the FY 2022/2023 pollution prevention(P2) grant cycle. This fact sheet summarizes environmental and P2 information for one of the NEAs: **the food and beverage manufacturing and processing sector** (NAICS 311 and 3121). According to the U.S. Census Bureau, this sector includes 36,477 establishments.[1] About 5 percent of these establishments (facilities) reported to the Toxics Release Inventory (TRI) for 2020.[1] TRI tracks the management of toxic chemicals as reported by U.S. industrial facilities. Annually, facilities report to TRI how much of each chemical is recycled, combusted for energy recovery, treated, and disposed of or otherwise released to the environment

Locations of TRI-Reporting Food and Beverage Manufacturing Facilities, 2020



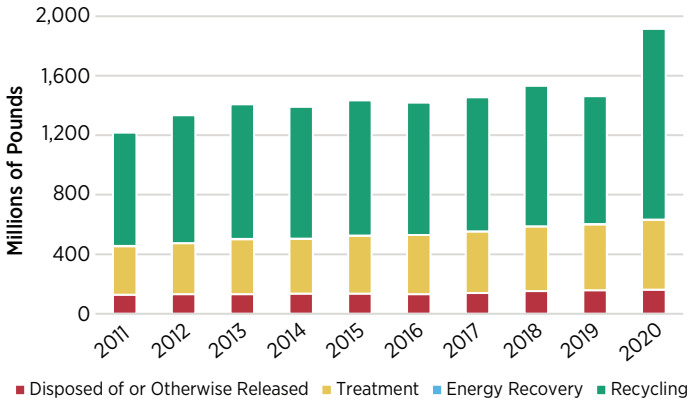
TRI Quick Facts for 2020

	Food and Beverage Manufacturing	All Sectors
Number of TRI Facilities	1,707	21,022
Total Production-Related Waste Managed (lb)	2.0 billion	28.3 billion
Total On-site and Off-site Disposal or Other Releases (lb)	162 million	3.0 billion
Total On-site (lb)	136 million	2.7 billion
• Air (lb)	43.2 million	550 million
• Water (lb)	78.8 million	194 million
• Land (lb)	14.3 million	1.95 billion
Total Off-site (lb)	26.2 million	348 million

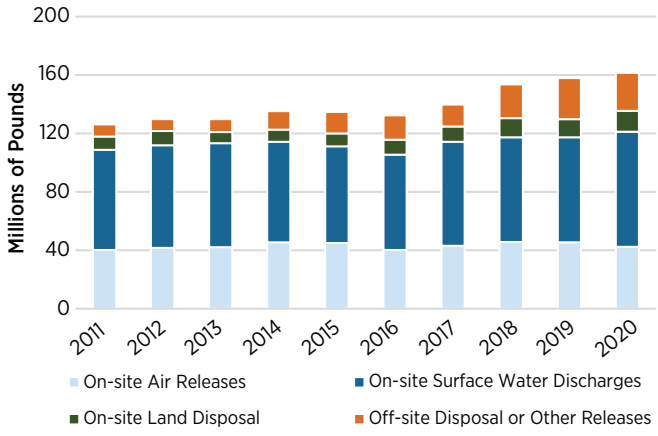
EPA encourages facilities to first eliminate the production of waste at its source (source reduction) prior to recycling, energy recovery, treatment, or disposal. The charts below show quantities of TRI chemicals released or otherwise managed as waste by the sector as reported to TRI. P2 technical assistance providers and others may be able to use the information below to identify opportunities that prevent chemical releases through source reduction activities. Information can be explored in more depth at EPA's TRI P2 Search Tool.

Food and Beverage Manufacturing

Waste Management Approaches



Total Releases by Media



For more information on P2 and the EPA's P2 Program, please contact the P2 Hub at: p2hub@epa.gov or 202-566-0799 or visit www.epa.gov/P2

[1] Data sources: U.S. EPA, 2020 TRI National Analysis data released October 2021; and U.S. Census Bureau, 2017 Economic Census.

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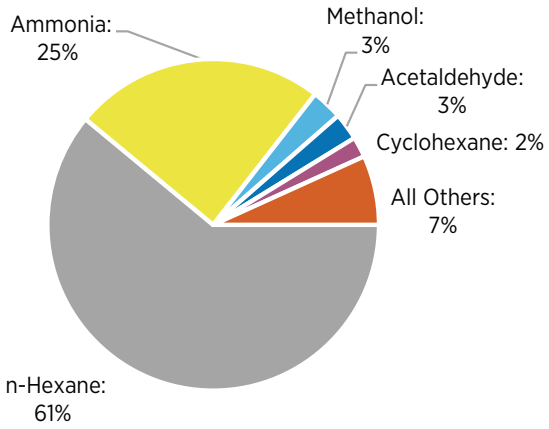
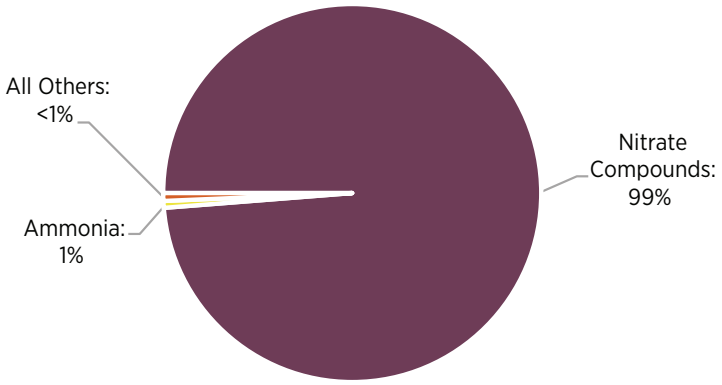
The following charts show the TRI chemicals released on site to air and water by facilities in the food and beverage manufacturing sector as a whole and for three selected food and beverage manufacturing subsectors: Fruit and Vegetable Preserving and Specialty Food Manufacturing (NAICS 3114); Dairy Product Manufacturing (NAICS 3115); and Beverage Manufacturing (NAICS 3121).

Food and Beverage Manufacturing

Releases to Air, 2020
43 million pounds

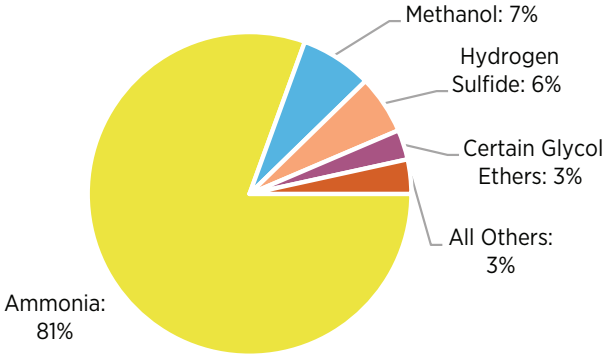


Releases to Water, 2020
79 million pounds

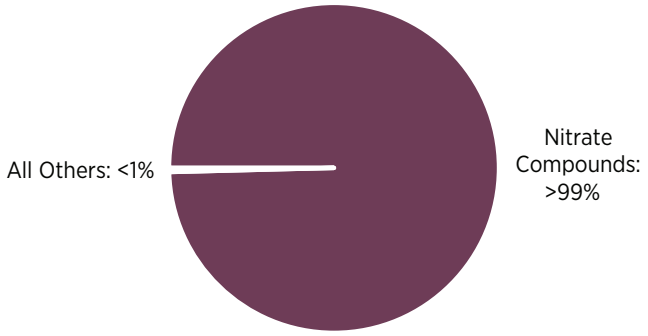


Fruit and Vegetable Preserving and Specialty Food

Releases to Air, 2020
502 thousand pounds



Releases to Water, 2020
8.5 million pounds



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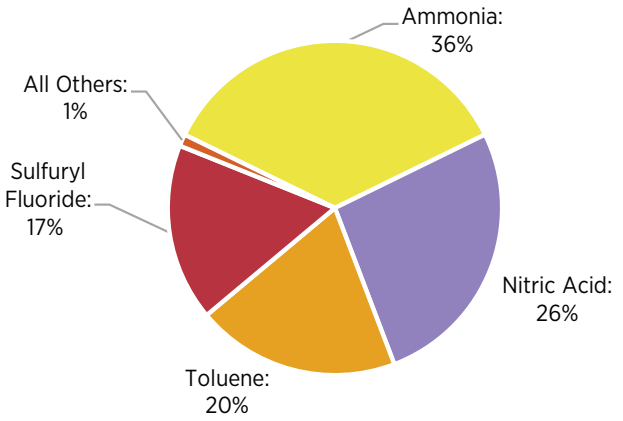
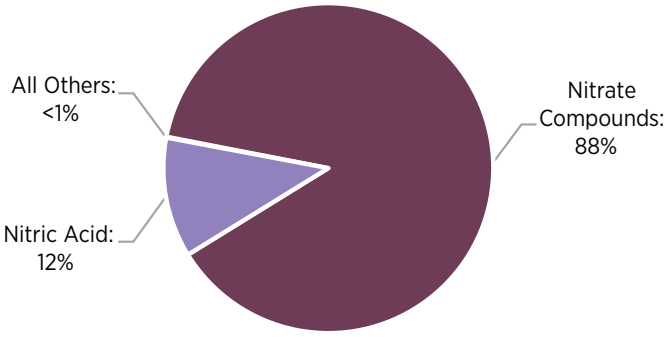
Dairy Product Manufacturing

Releases to Air, 2020
425 thousand pounds

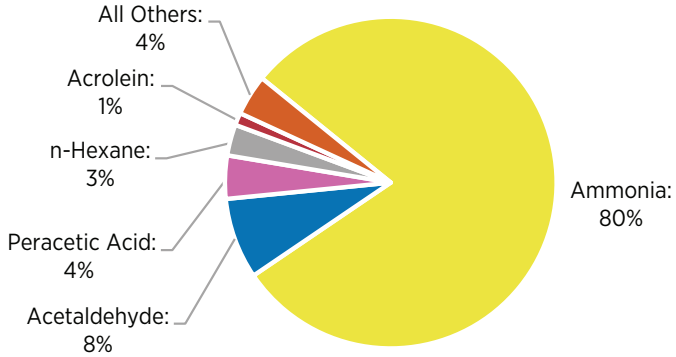


Releases to Water, 2020
2.1 million pounds

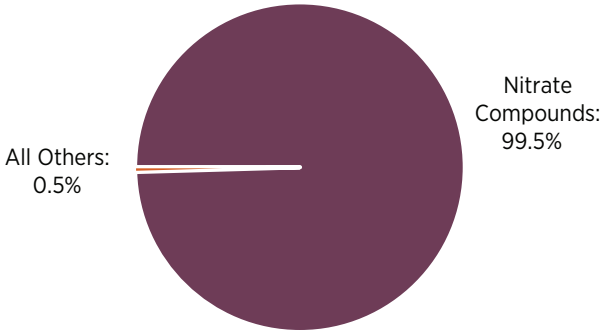


Beverage Manufacturing

Releases to Air, 2020
476 thousand pounds



Releases to Water, 2020
1.3 million pounds



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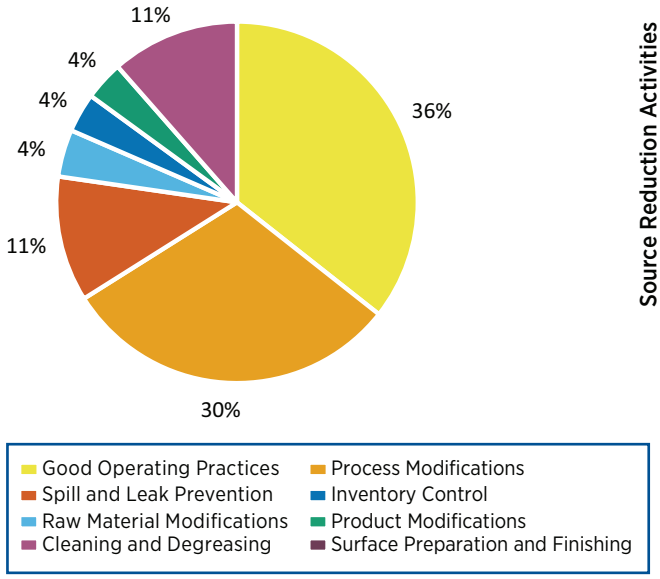
P2 Activities Reported to TRI

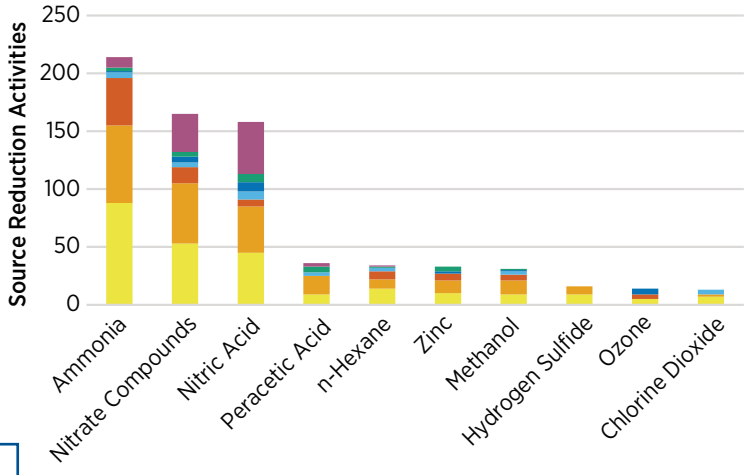
The figures below illustrate the source reduction activities reported to TRI by facilities in the food and beverage manufacturing sector for 2016 - 2020. In the bar chart, the number of source reduction activities reported for each metal and its compounds are combined.

Food and Beverage Manufacturing, 2016-2020

Source Reduction Activities



Source Reduction Activities by Chemical



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P2 Opportunities

Some examples of P2 achievements in the food and beverage sector from published sources are listed below. Some of the sources below link to non-EPA web sites. EPA cannot attest to the accuracy of non-EPA sources and providing links to a non-EPA source is not an endorsement by EPA of the source or the information it contains.

- **Improving maintenance schedules and monitoring leakages.** Cooling and freezing systems using refrigerants such as ammonia are common in food processing and preservation operations. Facilities save energy and prevent ammonia releases in refrigeration systems by improving maintenance schedules or reducing leakage.
    - The report, Ammonia, Hydrochloric Acid, Hydrogen Sulfide, n-Hexane, Nitric Compounds, and Sulfuric Acid in the Food Processing Industry, describes best practices for handling common chemicals in the industry and offers P2 tips and resources for facilities.
- **Pre-cleaning and dry cleanup.** Wastewater from some food processing facilities often contains high levels of organic matter. Pre-cleaning and dry cleanup procedures can reduce the amount of food wastes that end up in facility wastewater. For some facilities, this may eventually reduce the amount of wastewater treatment and monitoring required.
    - Clean Technologies in U.S. Industries: Focus on Food Processing identifies processes which might contaminate wastewater and methods of waste reduction in the food processing industry.
- **Installing flow meters and water control units** during cleaning processes may reduce a facility's water usage. Depending on the process, there may be opportunities to reuse some cleaning water for cleaning equipment or other outside areas, further reducing water usage.
    - The University of Minnesota Technical Assistance Program (MnTAP) offers a series of P2 fact sheets and case studies from a range of food processing facilities that implemented different wastewater management activities.

For more information on P2 resources for the sector, go to:

- TRI's Food Sector P2 webpage which summarizes: the major subsectors contributing to the TRI chemical waste managed and release quantities; how these quantities have changed over time; and the types of P2 practices implemented. To read the complete Food Manufacturing Profile, see Chapter 22 of *Green Energy to Sustainability: Strategies for Global Industries*.
- EPA's P2 Resources Search tool for a compilation of P2 case studies and other resources.
- TRI's Pollution Prevention Search tool to explore P2 activities reported to TRI.