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# Using Data to Improve Practice: Looking Back on 20 Years of Restaurant Food Safety Research

**Editor’s Note:** The National Environmental Health Association (NEHA) strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, NEHA features this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC’s Water, Food, and Environmental Health Services Branch, as well as guest authors, will share insights and information about environmental health programs, trends, issues, and resources. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

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In 2000, the Centers for Disease Control and Prevention (CDC), recognizing the important role environmental health programs play in food safety, funded a new cooperative agreement program on retail food safety called the Environmental Health Specialists Network (EHS-Net, pronounced S-Net). EHS-Net is a network of environmental health programs in state and local health departments focused on understanding how retail food service establishment policies and practices contribute to foodborne illness and outbreaks. EHS-Net staff collaborate closely with their counterparts in epidemiology and laboratory programs, and with CDC, the Food and Drug Administration (FDA), and the U.S. Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS).

EHS-Net staff are experienced in food safety and uniquely positioned to collect high-quality data on food safety policies and practices.

In its 20-year history, EHS-Net has conducted 15 retail food safety studies. These studies focused on restaurants because over one half of foodborne outbreaks are linked with restaurants (e.g., sit-down, fast food, deli) (Centers for Disease Control and Prevention [CDC], 2019). These studies, based primarily on data collection from observations of and interviews with restaurant staff, resulted in 50 scientific articles and 25 plain language summaries with key findings and recommendations ([www.cdc.gov/nceh/ehs/ehsnet/publications/index.htm](http://www.cdc.gov/nceh/ehs/ehsnet/publications/index.htm)). A recent review of these findings revealed key restaurant actions linked with food safety: having/

adopting procedures to minimize food safety risks, training staff on those procedures, and monitoring to ensure procedures are followed (Food and Drug Administration, 2018).



## Food Safety Procedures

EHS-Net found links between food safety procedures (e.g., policies, plans) and food safety.

- Restaurants with written slicer cleaning policies cleaned their food slicers more often (Brown et al., 2016).
- Workers in restaurants with a staffing plan for when workers couldn’t come to work and with an ill worker policy were less likely to have worked while ill with foodborne illness symptoms (Sumner et al., 2011).
- Restaurants with a cleaning policy had smaller norovirus outbreaks (Hoover et al., 2020).
- Restaurants with a date-marking policy practiced proper date-marking more often (Brown et al., 2021).
- Workers in restaurants with a policy prohibiting bare-hand contact with ready-to-eat food had less frequent behaviors that could lead to pathogen cross-contamination (Masters et al., 2018).



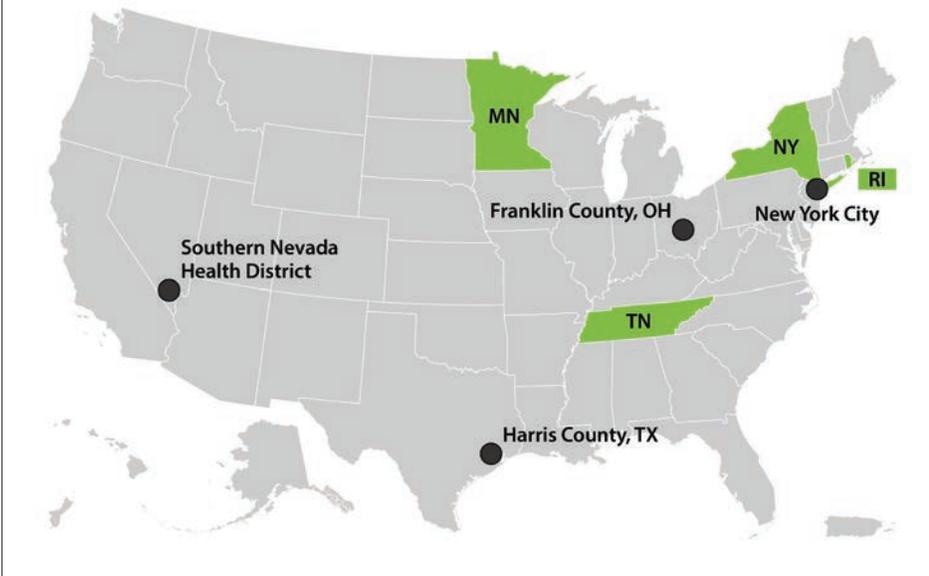
## Staff Training and Certification

EHS-Net studies consistently show links between training and certification and food safety.

- Restaurants with a certified manager had
  - » proper refrigerator temperatures more often (Brown et al., 2018).
  - » fewer critical violations on their inspections (Cates et al., 2009).

FIGURE 1

**Environmental Health Specialists Network (EHS-Net) 2020–2025 Sites**



a new rule requiring retail establishments to record specific information in their beef grinding logs (Records To Be Kept, 2015). As compliance with this rule increases, the ability to trace the source of outbreaks should increase.

- **USDA FSIS guidance on controlling *Listeria monocytogenes*:** EHS-Net identified gaps in retail deli policies and practices on preventing *L. monocytogenes* cross-contamination and growth. These data informed USDA FSIS (2015) to create a guidance document for retailers on best practices to control *L. monocytogenes*.
- **CDC’s *Vital Signs* guidance on norovirus outbreak prevention:** EHS-Net found that restaurants with policies that facilitated workers staying home when they are sick had workers that were less likely to have worked while sick. These findings informed CDC’s *Vital Signs* guidance on foodborne norovirus outbreak prevention (CDC, 2014).

**Conclusion**

Recently, EHS-Net embarked on a new 5-year cooperative agreement (2020–2025) with many of the same partners that contributed to past successful work (Figure 1). We look forward to addressing new food safety challenges together, with the goal of improving retail food safety practices and policies and restaurant food safety, as well as reducing foodborne illness and outbreaks. A primary focus going forward will be on preventing ill workers and norovirus outbreaks. 🍌

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- » smaller norovirus outbreaks (Hoover et al., 2020).
- Restaurants with managers trained in food safety more often used recommended food cooling methods (Reed et al., 2020).
- Restaurants with workers trained in food safety were more likely to have properly maintained food slicers (Lipcsei et al., 2018).
- Workers in restaurants that provided food safety training washed their hands when they needed to more often (Green et al., 2007).

**Monitoring**

EHS-Net has less frequently studied monitoring but has found links between food safety and monitoring.

- Restaurants that monitored cooling food temperatures more often held cooling food at appropriate temperatures (Schaffner et al., 2015).
- Restaurants that recorded refrigerator temperatures more often had proper refrigerator temperatures (Brown et al., 2018).
- Workers said that monitoring activities, such as completing hand washing and temperature logs, improved their ability to prepare food safely (Green & Selman, 2005). EHS-Net findings support the concept that strong food safety management systems—

composed of procedures, training, and monitoring—improve restaurant food safety and provide critical details about the management system components that are particularly important to system effectiveness. EHS-Net findings have been used to inform and improve national food safety policies and practices. These findings can also help the restaurant industry and environmental health programs improve restaurant food safety and reduce foodborne illness and outbreaks.

**EHS-Net Findings Helped Strengthen Food Safety Policies and Practices**

- **FDA *Food Code*:** EHS-Net findings on links between certification and food safety were used to strengthen kitchen manager certification provisions in the 2017 *Food Code*. The *Food Code* provides the basis for state and local food safety regulations and strongly influences retail food safety policies and practices (U.S. Department of Health and Human Services, 2017).
- **USDA FSIS Beef Grinding Log Rule:** EHS-Net found that most retail establishments did not record all the information needed about their beef grinding activities to allow investigators to trace the source of ground beef outbreaks. These findings informed

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## Did You Know?

The NEHA Vector Program Committee has posted a blog that highlights a new resource from the Centers for Disease Control and Prevention's Division of Vector-Borne Diseases: A National Public Health Framework for the Prevention and Control of Vector-Borne Diseases in Humans. The framework was constructed with input from five federal departments and the U.S. Environmental Protection Agency. The framework offers guidance in five key areas, including a better understanding of the risks associated with vectors and how to better support vector control agency efforts. Read the blog and learn more at <https://www.neha.org/membership-communities/get-involved/day-in-life>.