

Sanitizing Solution in Retail Delis

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Background

L. mono is commonly found in retail deli environments. This pathogen adheres to hard-to-clean and overlooked surfaces and requires specific types and concentrations of sanitizers to be eliminated from the environment (1). It is important to use correct concentrations of sanitizing solution on food contact surfaces to kill bacteria, avoid cross-contamination, and reduce foodborne illness risk.

The objectives of the analysis presented here were to:

- Describe the proportion of delis with improper sanitizing solution concentration, and
- Identify deli and staff characteristics associated with improper sanitizing solution concentration.

Methods

This study was conducted by EHS-Net, a collaborative program of the CDC, the Food and Drug Administration (FDA), the Food Safety and Inspection Service (FSIS) and six EHS-Net funded health departments (i.e., EHS-Net sites). These EHS-Net sites were California, New York, New York City, Minnesota, Rhode Island, and Tennessee (Figure 1).

Data collection. EHS-Net data collectors interviewed deli managers and workers and conducted observations in randomly selected retail delis in each of the six EHS-Net sites. The observation included measuring the concentration of one sanitizing solution in the deli, and determined if it met FDA guidelines. Delis that did not have an English-speaking manager were excluded from the study.

Analysis. To examine relationships between sanitizing solution concentration and deli and staff characteristics, we manually constructed a multiple logistic model using a forward selection procedure with an inclusion criteria of ≤ 0.10 as well as backward selection with an exclusion criteria of >0.10 . Variable selection preference was given to maintaining the maximum number of observations. We expressed our results in the form of prevalence ratios, which we calculated using NLMeans and NLEstimate macros derived from the PROC logistic procedure.

Results

Of the 691 managers of eligible delis contacted by data collectors, 298 (43%) agreed to participate in the study. In 64% (191) of these delis, data collectors were able to measure the concentration of one sanitizing solution. This sample of 191 delis was used to calculate descriptive statistics and logistic regression models.

Sanitizing solution concentration was incorrect in 54 delis (28.3%) (Figure 2).

Multiple logistic regression model results showed that improper levels of sanitizing solution were more prevalent at delis:

- that were independently-owned (vs. chain-owned)
- where deli manager was more experienced
- that sold fewer chubs (plastic tubes of meat) weekly
- that required manager food safety training
- that did not provide food safety training to its workers (Table 1).

Table 1. Multiple logistic regression model findings: deli and staff characteristics associated with improper sanitizing solution concentration

Characteristic	Comparison	PR (95% CI)	p-value
Ownership type	Independent vs. Chain	2.72 (0.56, 4.88)	0.013
Manager experience (years) (p=0.072)	10 to 20 vs. <10	2.25 (-0.53, 5.04)	0.184
	>20 vs <10	3.46 (-0.69, 7.61)	0.029
Number of chubs sold weekly	≤ 30 vs. >30	3.14 (0.30, 5.98)	0.009
Manager food safety training required by deli	Yes vs. No	3.71 (0.16, 7.25)	0.005
Workers received food safety training at current deli	No vs. Yes	2.08 (0.55, 3.61)	0.055

Relationships between chain ownership and food safety training and food safety, like those found in this study, have been previously documented. Consistently, restaurants that are chains and provide food safety training have safer practices. Additionally, it was found that busier restaurants are more likely to engage in safer practices (2). Selling more chubs likely translates to higher levels of activity or volume.

Delis with more experienced managers may have improper sanitizing solution concentration because the experienced managers may be experiencing 'burn-out', and be more likely to overlook worker performance and food safety practices.

The finding that delis that required manager food safety training were more likely to have improper sanitizing solution concentration seems counter-intuitive. More research is needed to explore this relationship.

Figure 1. Locations of the EHS-Net sites that conducted this study

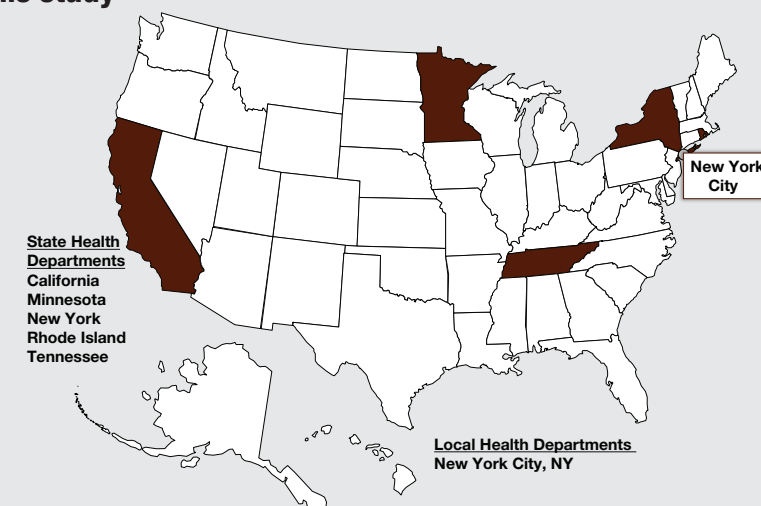
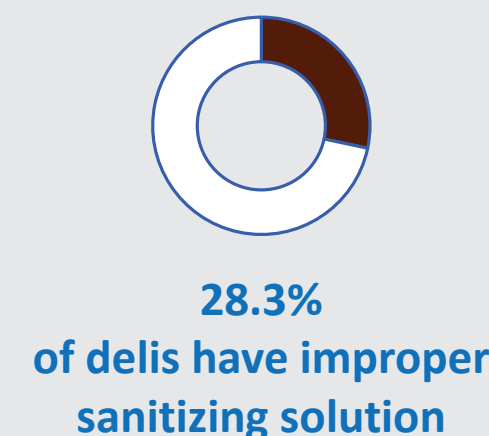


Figure 2. Percent of delis with improper sanitizing solution concentration



Conclusions

Our data suggests that some delis need to improve their sanitizing solution practices. Interventions in this area should focus on food safety training for workers and on independent and smaller delis. Given our unexpected findings linking manager food safety training with incorrect levels of sanitizing solution, future researchers may wish to study the relationship between manager training and food safety practices.



References/Acknowledgments

1. Scallan, E., et al., Foodborne illness acquired in the United States — major pathogens. *Emerg Infect Dis*, 2011. 17(1): p. 7–15
2. Lipcsei, L.E., et al., Retail Deli Slicer Inspection Practices: An EHS-Net Study. *J Food Prot*, 2018. 81(5): p. 799–805

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