

Environmental microbial risks associated with vented produce in distribution centers



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Summary

The Food and Drug Administration's (FDA) Preventive Controls for Human Food Rule requires environmental monitoring programs within registered facilities, including distribution centers (DCs) that handle produce. Generally, in the DC environment, product arrives fully packaged and receives minimal to no handling. However, produce is also typically packaged in bags or boxes that allow for dissipation of accumulated gas and moisture generated by the produce after harvest. For this reason, FDA suspects that produce entering DCs may be at risk from environmental contamination. Little information exists regarding the likelihood of microbial contamination within DCs. This project is surveying management practices and sampling DCs to determine contamination risk in these environments, and will identify potentially high-risk practices or equipment to assist management in evaluating the risks in their facilities.



Benefits to the Industry

Currently, no data exists regarding the microbial environmental conditions in DCs that handle fresh, vented produce. This project will a) identify if contamination by *Listeria* spp. should be considered a potential risk in DCs, and b) identify commonly implicated locations, equipment, features, or practices that might require mitigation to reduce the risk contamination from the environment spreading to vented produce. If the study determines that environmental contamination is a concern in DCs, these data will be used to generate guidance for these facilities to facilitate rapid interventions and implementation of best practices for risk reduction.

Objective

Collect current cleaning and sanitizing practices through a survey and on-site observations in parallel with microbial sampling within storage and handing areas in at least 25 DCs.

These data will be used to provide risk mitigation guidance for regulatory and industry partners addressing the likelihood of environmental contamination to vented produce in DCs, and potential risk mitigation procedures for identified hazards

Methods

A sampling team of 3-4 project members participates in each DC visit. The team first interviews management and obtains relevant documents regarding facility design or maintenance: sanitation standard operating procedures, facility maps, cleaning and sanitizing schedules and protocols, etc. After the interview, the team begins sampling throughout the facility in all areas through which fresh produce passes, or through areas where tools and equipment used in fresh produce areas may be kept (maintenance areas, cleaning closets, etc.). Sponge and air samples are collected from Zone 2-4 surfaces, placed immediately on ice, and shipped to the lab for immediate processing for *Listeria* spp. Relative humidity, temperature, and ATP measurements (relative light units) are also recorded.

Results to Date

As of June 2020, six DCs have been visited and sampled. Based on sampling data (**Table 1**) from the DCs, several sites already appear to be of particular concern regarding *Listeria* spp. harborage. Sponge samples ($n = 243$) have been collected across all six facilities. Of these samples, 11 (4.5%) tested positive for *Listeria* species. To date, *Listeria* spp. positive samples occur most commonly (6/11; 54.5%) in floor cracks, seams, and repaired/patched flooring. Other *Listeria* harborage sites have included distribution and sanitation equipment, such as pallet jack wheels, a squeegee, and a dust mop. These sites have been previously associated with *Listeria* harborage in food facilities. No air impaction samples have indicated presence of airborne *Listeria*.

Table 1. *Listeria*-positive samples collected between December 2019 to February 2020

| Distribution Center ID* | Sample site (general location) |
|-------------------------|--|
| 1 | Crack in floor near entryway (receiving) |
| 1 | Wooden table (shipping) |
| 1 | Floor in cleaning/sanitation area |
| 3 | Floor seam (receiving) |
| 3 | Wheels of pallet jack (receiving) |
| 3 | Fabric of dust mop (receiving) |
| 3 | Floor crack and epoxy patch (storage) |
| 5 | Squeegee (storage) |
| 6 | Patch in concrete and rubber/latex-based coating on concrete (storage) |
| 6 | Floor crack (storage) |
| 6 | Floor seam near bay door (receiving/shipping) |

* No positive samples were collected at DC #2 or #4.