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# Technical Article

Technical Article Content Pulled from the NIBA Belt Line Newsletter

## Slicers and Belts Prove High Risk for Listeria Contamination

*Contributed by Jane Byrne (reprinted with permission)*

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The researchers, in a study published in Food Control said that they investigated the occurrence and genetic diversity of *L. monocytogenes* in a Swiss sandwich-producing plant over a 12-month period, with the goal of evaluating the potential persistence of *L. monocytogenes* there in order to identify possible contamination sources. *L. monocytogenes* as a food-borne pathogen has significant public health and economic impacts with manufacturers of ready-to-eat foods required, under EU regulation, to examine the processing environment for microbe as part of their hazard analysis critical control point (HACCP) approach and sampling schemes.

### The Study

The research team, from the Institute of Food Safety and Hygiene in Zurich, said they first evaluated the basic situation and the potential persistence of *L. monocytogenes* strains in the plant, and then evaluated the effect of revised cleaning and disinfection procedures with a focus on identified problem areas. Sampling, they said, was performed twice a week and comprised about 80 samples per visit, reported the team. The team said they took 1,192 samples from the equipment of the sandwich processing lines such as slicers, knives, or conveyor belts, as well as 307 samples from the environment including drains, walls, or floors. Samples totalling 217 were taken, they added, from ready to-eat ingredients prehandled in the plant such as salmon, ham, or salami sliced. Additionally, 529 samples from the equipment and environment were obtained after cleaning and disinfection, said the researchers.

### Strain Findings

*L. monocytogenes* were detected by culture after enrichment in 70 (3.5 per cent) of 2,028 environmental swabs and 16 (7.4 per cent) of 217 samples from ingredients and sandwiches. Of the 86 *L. monocytogenes* strains, 93 per cent belonged to serotype 1/2a and genetic lineage II. Rep PCR and PFGE analysis yielded each six profiles, found the authors.

### Tainted Machinery

Sixty-seven (77.9 per cent) strains belonged to only one genotype, which was repeatedly found on/in slicers, conveyor belts, tables, a bread-feeding machine, spatulas, air blowguns, salmon, and egg sandwiches, said the authors. They said that strains of this genotype persisted for more than nine months in the processing environment, in particular on slicers and conveyor belts. The authors noted that due to their construction, slicers or conveyor belts are often difficult to clean and maintain adequately and therefore constitute probable contamination sources for food products. Moreover, they claim air blowguns and water hoses testing repeatedly positive for strains of certain genotypes might indirectly contribute to the contamination of food products by the hands of employees.

### Repeated Cleaning

Based on the data from the first sampling phase, they said, cleaning and disinfection procedures of the plant



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were revised with a main focus on identified problem areas, including enhanced supervision by the quality assurance management. The second sampling phase evaluated the effect of the revised cleaning and disinfection schemes, and also included the examination of additional difficult to clean areas of the processing environment, added the authors. They said that after revision of the cleaning and disinfection procedures, *L. monocytogenes* were no longer found on slicers, conveyor belts, or in products but were still detected sporadically in environmental samples such as water hoses. The intensified examination, said the team, also identified the inside of a bread-feeding machine as a further problem area.

The four *L. monocytogenes* strains from the bread-feeding machine all belonged to the predominant genotype (Rep PCR profile a, PFGE profile A) and were obtained during the first two visits but after revision of the cleaning and disinfection scheme of this machine, *Listeria* were no longer found, reported the researchers.

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