

## 4-20 Environmental Sampling for Detection of *Listeria monocytogenes*, CFSAN Guidance

### BACKGROUND

*Listeria monocytogenes* has been associated with such foods as raw milk, supposedly pasteurized fluid milk, cheeses (particularly soft-ripened varieties), ice cream, raw vegetables, fermented raw-meat sausages, raw and cooked poultry, raw meats (all types), and raw and smoked fish. Its ability to grow at temperatures as low as 0°C permits multiplication in refrigerated foods.<sup>4</sup> Listeriosis is a foodborne illness of major public health concern because of the severity of the disease (meningitis, septicemia, and pregnancy complications such as miscarriage or stillbirth), a high case-fatality rate, and a long incubation period. *Listeria monocytogenes* differs from most other food-borne pathogens because it is widely distributed, resistant to diverse environmental conditions, including low pH and high NaCl concentrations, and is microaerobic. The multitude of ways it can easily enter food processing plants and its ability to grow and survive for long periods of time (in the environment, in/on foods, and in food processing plants) under adverse conditions have made it a major concern for many manufacturing industries in recent decades.<sup>2</sup>

### SAMPLE COLLECTION

DO Collect Samples From:	DON'T Collect Samples From:
Moist/wet areas with standing water	Dry, clean areas
<b>Direct food contact surfaces</b>	Employees – work shoes, hands etc
Floors and related areas – Under floor mounted equipment, scales (floor and table mounted)	Hand wash or eyewash stations
Sanitizing foot mats – if disinfectant is not maintained this can be a good harboring source and point of transfer to other areas of the facility	Packaging materials – jars, lids, etc
Cleaning Equipment – automated floor cleaning equipment, brooms, mops, waste containers especially underside, etc	Raw agricultural products – raw peanuts etc or any food contact surface used exclusively for raw foods.
Air conveying equipment – pressurized air lines, air hoses, condensate from pressurized air lines, HVAC evaporators and evaporator condensate pans	Outside the plant – roof, parking lot, walkways, etc.
Product conveyors – cables, belts, joints, where product residue accumulates, exposed bearings and rollers, sponge or felt rollers used to remove moisture from product	Zone 4
Motor and Electrical Housings – that are not cleaned and/ or sanitized.	
Cracked equipment – boots (shock absorbing equipment), metal joints, etc.	
Under sinks / safety stations – Under hand wash or eyewash stations if appearance of leaks, cracks, etc.	
Equipment – areas that are difficult to reach and clean, non-food contact surfaces, nooks and crannies.	
Doorways - floor area leading directly into production areas	
Drains – Not during production	
Ice Makers – inside, scoops, underside of top of ice chamber	
Ceilings and Walls – in production areas coolers and freezers	
Door gaskets to coolers and freezers; damp insulation around pipes	

### References:

1. FDA. Investigations Operations Manual 2008. 4.3.7.7 – Environmental Sampling
2. Doyle, Michael et al. Food Microbiology Fundamentals and Frontiers 2<sup>nd</sup> Ed. Pgs 383-403.
3. Cliver, Dean and Riemann, Hanns. Foodborne Diseases 2<sup>nd</sup> Ed. Pgs 55 – 67
4. Bad Bug Book. *Listeria monocytogenes* , Page 100
5. Control of *Listeria monocytogenes* in Refrigerated or Frozen Ready to Eat Foods Draft Guidance.