



Enviro^{X-F} and Enviro^{X-Rv}

Two Breakthrough
Products for the Food
Industry to Preserve the
Safety of Food & Its
Employees

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If the Food Industry didn't have enough challenges, now it's a whole new ball game!!



Our Central focus on Safety is eliminating Pathogens

- *E. coli*

- [*E. coli*](#)
- [FoodSafety.gov: Food Poisoning - *E. coli*](#)
- [CDC: *E. coli*](#)

- *Salmonella*

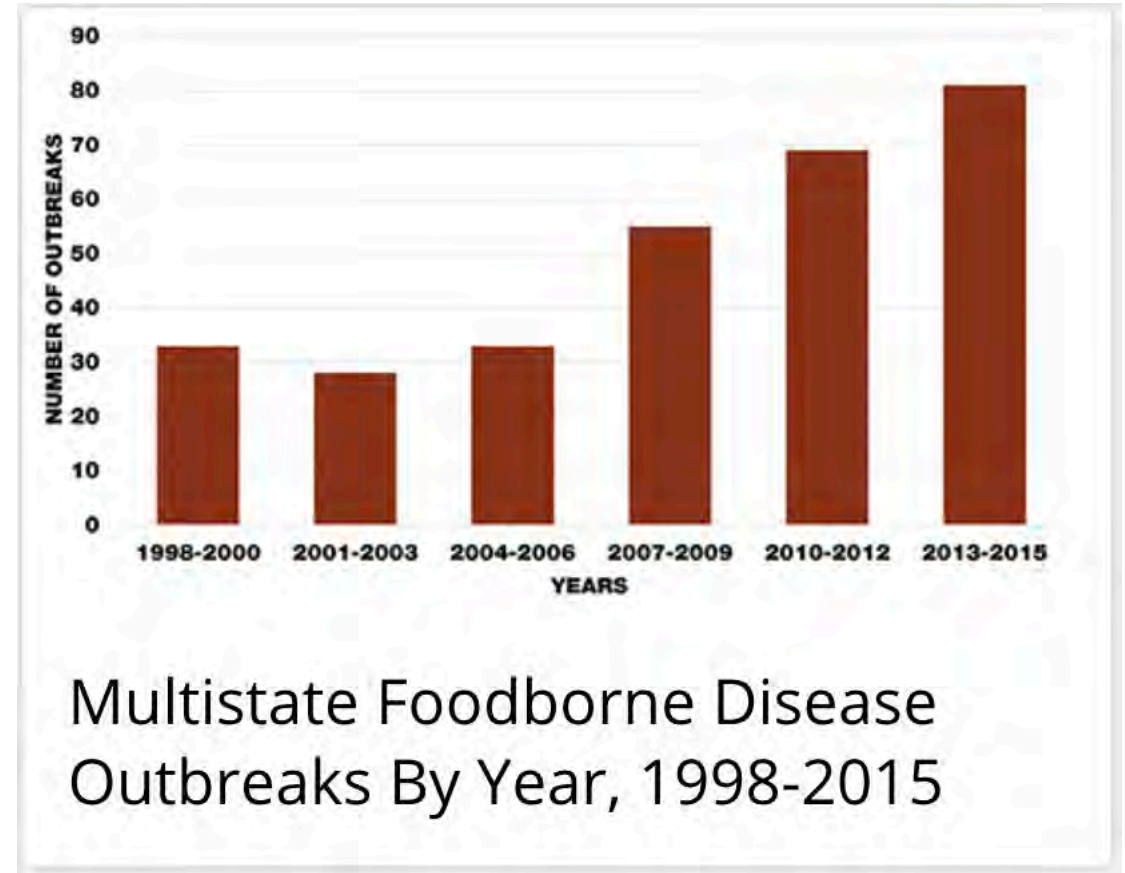
- [*Salmonella*](#)
- [FoodSafety.gov: Food Poisoning - *Salmonella*](#)
- [CDC: *Salmonella*](#)

- *Listeria*

- [*Listeria*](#)
- [FoodSafety.gov: Food Poisoning - *Listeria*](#)
- [CDC: *Listeria*](#)

- *Cyclospora*

- [*Cyclospora*](#)
- [Cyclosporiasis and Fresh Produce](#)
- [CDC: Cyclosporiasis](#)



<https://www.cdc.gov/foodsafety/cdc-and-food-safety.html>



DNA Microarray: Accurate, Multiplex Assay with Results in less than 8 hours

- E. coli
- **Salmonella**
- Campylobacter
- **Listeria, LM**
- Others
(Staphylococcus,
Shigella)



The Enviro^{X-F} DNA Microarray is designed to identify specific microorganisms down to 1 CFU in multiple validated matrices.



Enviro^{X-F} Kit: Swab Away Uncertainty to ensure the Environment does not contaminate your Food Product

- Bacterial identification through specific genes
- Multiple controls and standards
 - PCR Positive Controls
 - Negative Controls
- Flexibility to include additional organisms as regulations fluctuate
- AOAC PTM in Process
- Detection Limit: < **1CFU/gram**



Enviro^{X-F} Content

Bacteria Organisms –

- *Escherichia coli* specific
- *Escherichia coli/Shigella* spp.
- *Salmonella enterica*
- *Staph aureus*
- *Listeria*
- *Listeria monocytogenes*

Specific Genes

- Stx1 – Shiga Toxin 1
- Stx2 – Shiga Toxin 2

Controls

- PCR Positive Control
- Negative control



But Now....its the employees also where their health is at RISK
CDC: Nearly 5,000 Meat Processing Workers Infected With COVID-19

CASES IN MEAT PROCESSING PLANTS

WESTERN KENTUCKY

**FACTS
NOT FEAR**

- **PERDUE FARMS**
239 CASES 1 DEATH
- **TYSON FOODS**
99 CASES NO DEATHS
- **SPECIALTY FOOD GROUP**
41 CASES NO DEATHS



SARS-CoV-2 Persists on Surfaces and in the Air

The NEW ENGLAND JOURNAL of MEDICINE

CORRESPONDENCE

Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1

A study from the National Institutes of Health, CDC, UCLA and Princeton University in *The New England Journal of Medicine* found that the virus that causes Coronavirus disease 2019 is stable for several hours to days in aerosols and on surfaces.



Enviro^x-Rv: Ultra-Rapid Environmental SARS-CoV-2 Pathogen Screening Panel



Aerosol Sample



Surface Swab



TARGET ORGANISMS

VIRAL

- SARS-CoV-2 (2019-nCoV),
- SARS-CoV
- MERS-CoV,
- CoV 229E,
- CoV OC43,
- CoV NL63, and
- CoV HKU1)
- Influenza virus A-type
- Influenza virus B-type
- Norovirus



**Step 1: Collect
Aerosol or
Surface Specimen**



**Step 2: Process
the Sample**



**Step 3: Know
Pathogen results
in less 6 hours**

- Multiplex Viral Testing
- High Sensitivity & Specificity
- Pooled Sample Capability
- Low Cost per Sample
- Results in < 6 Hours



PathogenDx: Aerosolized and Surface Sample Collection



Microbial Air Sampler for Indoor Bio-contamination



Add 15mL of Sterile Liquid



Adjust settings Based on size and time



Capture airborne Pathogens in liquid output up to 6 Hours









Environmental Surface Swabs

Process Samples into Envirox-Rv Analysis process (next slide)



Enviro^x-Rv PathogenDx Process Flow

| Standard Sample Workflow | | Enviro ^x -Rv Workflow | | | |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| Sample Collection | Sample Processing | Enrich PCR | Labeling PCR | Hybridization | Imaging & Analysis |
| <ul style="list-style-type: none"> • Air Sample Collection • Surface Swab Collection | <ul style="list-style-type: none"> • 1.5 hours • Standard RNA extraction with Magnetic Beads <ul style="list-style-type: none"> • <i>Vortex/Lysis/Bind/Wash & Release</i> • 2x96 (manual) samples/hour | <ul style="list-style-type: none"> • 2 hours • PCR (DNA) • RT-PCR (RNA) • 2x96 samples/hr | <ul style="list-style-type: none"> • 1.5 hour • Fluorescent Tag • Single Stranded • 2x96 samples/hr | <ul style="list-style-type: none"> • 1 hour • 100 arrays in parallel-manual | <ul style="list-style-type: none"> • 15 minutes / kit • 96 arrays in parallel • Autonomous data analysis |

2X96 TESTS IN PARALLEL -SAMPLE TO DATA UPLOAD <6.5 HOURS



**THE PATHOGENDX
MICROARRAY.**

A DNA-BASED BREAKTHROUGH

We're setting a standard in DNA
Testing