Clear Labs

Clear Safety® Salmonella

Automated, Rapid NGS Serotyping

What Is Clear Safety?

PCR, culturing, and antigen-based tests tell you whether a pathogen is present or absent. Clear Safety offers much more as the **first automated, intelligent NGS platform** that's purpose-built for **food safety testing.** Instead of targeting a single genomic region, Clear Safety generates hundreds of millions of data points per analysis that can be used to learn significantly more than what previous pathogen screening platforms allow. It provides all the data you need, without the liability of whole genome sequencing.

Reportable Salmonella Serotypes with Clear Safety

Abaetetuba	Dublin	**Kentucky**	Norwich	Sandiego
Agona	**Enteritidis**	Lille	Ohio	Schwarzengrund
Alachua	Gallinarum / Pullorum	Litchfield	Oranienburg	Senftenberg
Albany	Gaminara	Liverpool	Ouakam	Stanley
Anatum	Give	Mbandaka	Panama	Tennessee
Bareilly	Hadar	Meleagridis	Paratyphi B	Thompson
Barranquilla	Havana	Minnesota	Pomona	Typhi
Berta	**Heidelberg**	Mississippi	Poona	**Typhimurium**
Blockley	**I 4,[5],12:i:-**	Molade	Putten	Uganda
Braenderup	Idikan	Montevideo	Reading	Virchow
Cerro	**Infantis**	Muenchen	Rissen	Worthington
Cubana	Javiana	Muenster	Roodepoort	
Derby	Johannesburg	**Newport**	Saintpaul	

Note: The "Top 7" serotypes (highlighted in blue) can be reported in co-presence scenarios.

The Disadvantages of Traditional Serology

Traditional *Salmonella* serotyping is a time-consuming, labor-intensive process that requires trained technicians, the management of various reagents and consumables and exposes the laboratory to additional contamination. The result is highly dependent on the strain's ability to express the antigens being detected and ultimately the technician's ability to subjectively "tease out" the serotype in the presence of competing organisms. Additionally, in cases of co-infection where more than one serotype is present in a sample, the accuracy of the result is ultimately dependent on how thorough the microbiologist is when identifying suspect *Salmonella* colonies on selective and differential agars. In other words, many serotypes may go undetected.

Additionally, the long turnaround time and high costs associated with serotyping usually lead to customers being selective with how many samples get serotyped per year. With traditional serotyping results sometimes taking more than two weeks, the data is academic by the time it gets to your FSQA team.

Salmonella Serotyping with Clear Safety

With *Salmonella* serotype information, food safety professionals can begin to track and trend recurring serotypes of *Salmonella* and potentially link a contamination event to a source. This has resounding implications for mapping a manufacturing process and making faster, more informed decisions that impact not only consumer safety, but also operational efficiencies and the bottom line. Compared to the amalgamation of technologies that it would take to achieve the same result, Clear Safety is typically days, or even weeks, faster than other methods.

Serotyping: Clear Safety vs. Other Methods

	Traditional Serotyping Methods	Rapid Serotyping Methods	Clear Safety
Turnaround time	3-5 days after initial screen result	3+ days after initial screen result	Next day serotype identification
Results	Subjective calls	Objective answers	Objective, easy-to-read answers
Testing source	Pure culture required	Pure culture required	Enriched samples or pure culture
Automation	Currently unavailable	Limited automation after pure culture obtained	High-throughput robotics that eliminate labor and subjective errors

→ Clear Safety is the only NPIP approved method for routine *Salmonella* screening that also offers serotyping with the ability to identify co-contamination.

Automation Curtails Errors and Inefficiencies

Our automated workflow reduces hands-on time, technical error, and variability. Rather than requiring a team of bioinformaticians and PhD scientists, Clear Safety liberates sequencing to the masses with a workflow that requires fewer manual steps than PCR.

Superior Accuracy Sharply Reduces False Positives and Negatives

Through Live Cell Assurance and built-in genetic marker redundancies, Clear Safety's accuracy sharply reduces false negatives and positives, curtailing recall risks, operational costs, holding time, and short-shipping penalties. With >99.9% accuracy, we give you the best screening assurance in the industry. You can stop chasing ghosts and start shipping product.

Fast Turnaround Time Allows You to React Quicker

With next day serotyping, you can act to remediate positives faster than ever before. Clear Safety shaves days off the turnaround time for serotyping, empowering food safety teams with actionable, rather than academic, data. Due to our superior accuracy, customers have eliminated inventory hold time waiting for a positive confirmation because they can believe in, and react to, presumptive results.

How Does Clear Safety Compare to PCR?

	Accuracy	Pathogen Profiling	Throughput	Automation	Environmental Mapping
PCR	Higher rates of false positives and negatives	Not included, requires additional methods	Up to 96 samples per run	Hands-on labor, prone to errors	Environmental mapping software not included
Clear Safety	>99.9% accuracy, resulting in dramatically lower rates of false positives and negatives	*Salmonella* serotyping and *Listeria* speciation & strain typing are faster and cheaper than legacy methods	Up to 192 samples per run	Robotics that reduce labor and errors	Resident/transient analysis and mapping included

Key Benefits of Serotyping with Clear Safety

Cost Effective

With Clear Safety, *Salmonella* screening and serotyping are conducted at the same time, using the same assays, media, and consumables. As a result, our serotyping tests help your company to improve its bottom line.

Clear Results

We simplify the process. Rather than relying on an expert eye to analyze colonies, we give you objective, easy-to-read results, saving you time and removing subjectivity.

Fast Turnaround Time

Salmonella serotyping can be conducted with next day results, enabling you to act faster when a contamination event occurs.

Multiple Serovars

Unlike traditional serology, Clear Safety can detect multiple serovars from the same sample, thus providing more complete information about your samples.

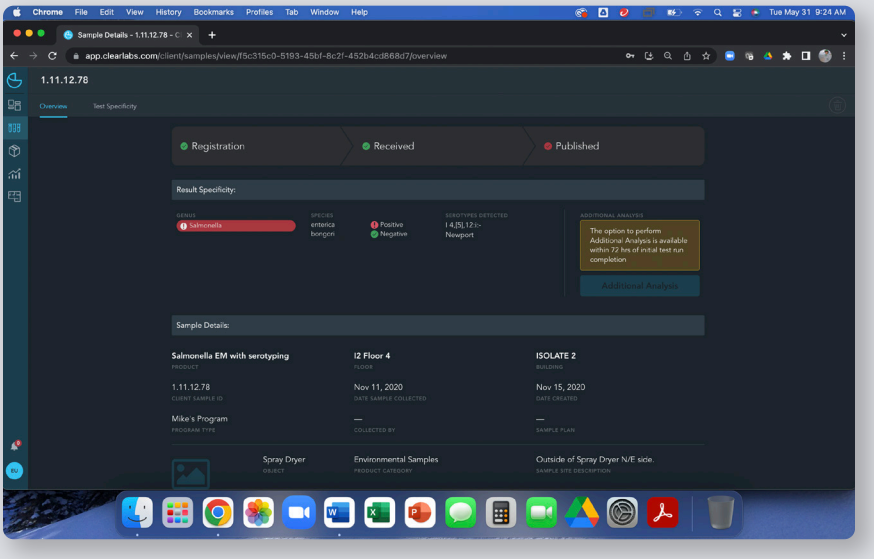
Highest Accuracy

Using NGS, we look at multiple regions of the genome in order to correctly identify serotypes.

Tunable Characterization

Choose your level of specificity. Test for any combination of *Salmonella* serotypes.

Sample Serotyping Results with Clear Safety



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