



a New Era of Smarter Food Safety

An Overview



@frankyiannas

Lifetime in Food Safety



A black and white scanning electron micrograph (SEM) showing numerous rod-shaped bacteria, likely E. coli, against a black background. The bacteria are of various sizes and orientations, some appearing in focus and others blurred in the background.

**Are we WINNING
the battle against
foodborne disease?**

Foodborne Pathogens 1900 - 1939

- Amoebiasis
- Botulism
- Brucellosis
- Cholera
- Hepatitis
- Salmonellosis
- Scarlet fever (streptococcus)
- Staphylococcal food poisoning
- Tapeworms
- Trichinosis
- Tuberculosis, bovine
- Typhoid fever

Source: CDC, USA

**Nearly 600 with Salmonella, 225 hospitalized
and 15 deaths linked to Cantaloupe**



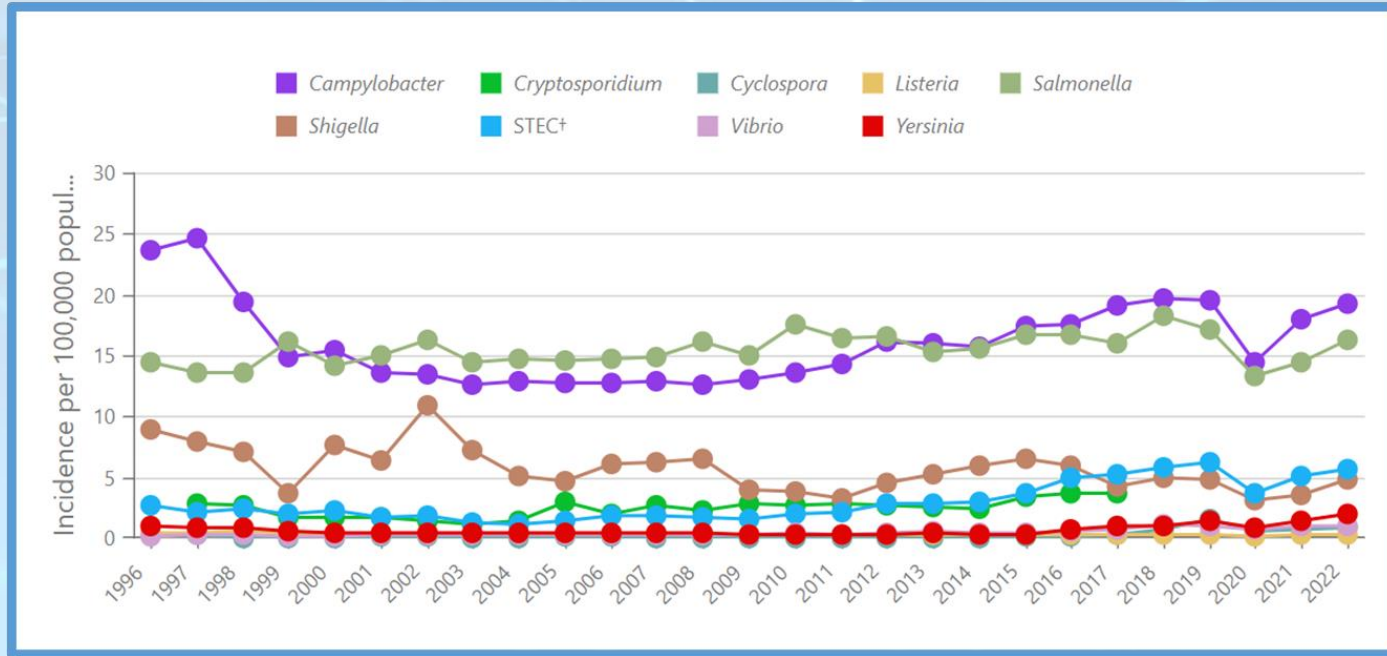
These parents didn't know why their children had lead poisoning. An applesauce recall offered clues.

Listeria outbreak linked to recalled dairy products, including queso fresco and Cotija cheese



Incidence of Foodborne Illness in the United States

The Past Two Decades
1996 to 2022



Source: CDC FoodNet

<https://www.cdc.gov/foodnet/foodnet-fast.html>

Improved Food Safety

What Got Us
HERE

2024

Won't Get Us
THERE

2030



world is changing





food revolution

Making the Invisible Visible



COVER STORY: ANATOMY OF AN OUTBREAK: How salmonella sleuths solved a deadly mystery

Credit cards led investigators to source of E. coli outbreak



Online tools may have warned of listeriosis outbreak: study

How NC health investigators discovered applesauce was poisoning children

State and local health specialists in North Carolina identified the lead contamination in WanaBana Apple Cinnamon Fruit Puree pouches, leading to a recall.



In Common?



Political Scandals



NOT CONVINCED WE'RE BEING

consumer trust bust

Almost seven in 10 people believe they're being lied to by the media and government. Image: Edelman Trust

a new era of heightened concern over **Chemicals in Food**

1900's



Sanitation

The Jungle, Walls,
Floors, & Ceilings,
Food Science, &
Food Processing

1980S -
2020s



Microbiological

Listeria, Jack-in-
the-Box, HACCP,
PFGE, Spinach, PCA,
FSMA, and WGS

2020S &
beyond



Chemical

Pesticides, Heavy
Metals, Food
Additives,
Aflatoxins, PFAS, &
more

evolution of
FOOD SAFETY

Changing Food System
Foodborne Surveillance
Global Food Supply
Consumer Trust Bust
Food Fraud
Trace Chemicals
Climate Change



Challenges to the Food Safety

A Modern Approach for Modern Times



People-Led * FSMA-Based * Data-Driven * Technology-Enabled

Tech-enabled Traceability



Smarter Tools and Approaches for Prevention and Outbreak Response



New Business Models and Retail Modernization

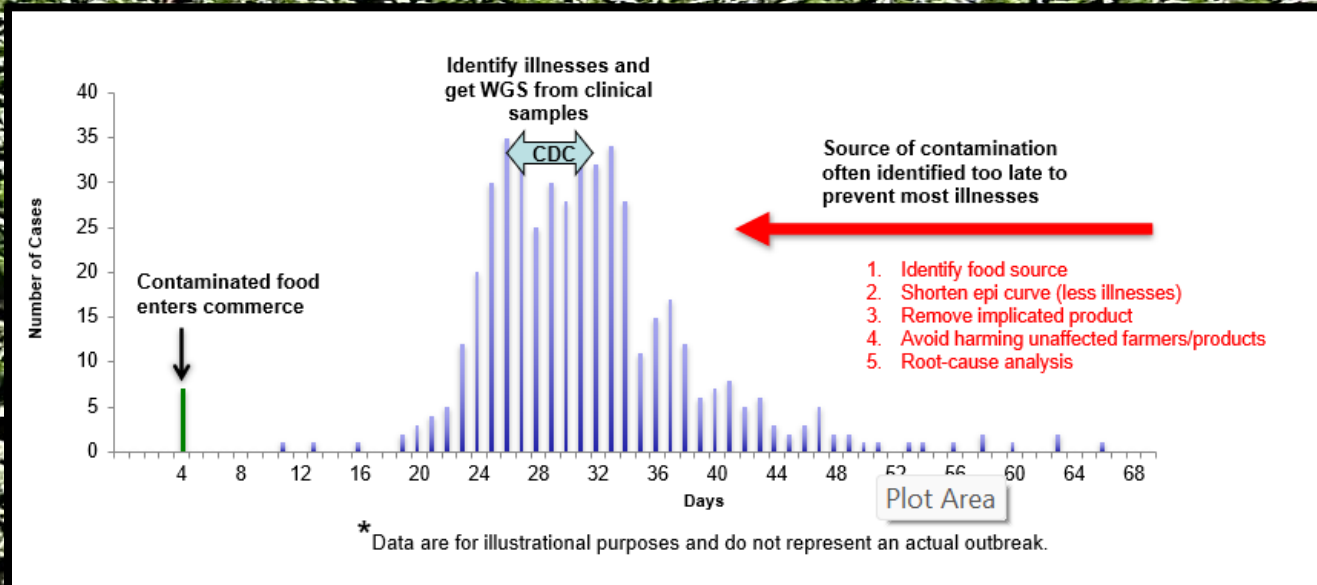


Food Safety Culture



Tech-Enabled Traceability

Americans told to toss romaine lettuce over E. coli fears





> 3,900 SKUs



FDA's Final Food Traceability Rule



Tech-Enabled Traceability

Key Data Elements (KDEs)



Farmer



Packing House

Critical Tracking Events (CTEs)



Distribution Center

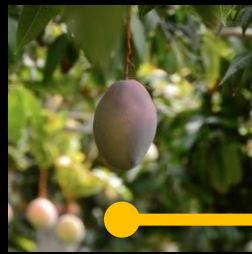


Store

FoodTraceability Lot Codes



Consumer



6 Days, 18 Hours, 26 Minutes



Sell by Date: 01/07/17
Total Price \$4.78
Price per LB \$4.78
Net Wt. 16 OZ (454g)

2.2 Seconds instead of 7 Days



Transparency



Anonymity

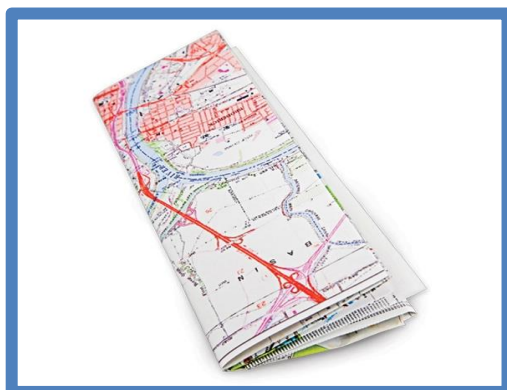




Smarter Tools and Approaches for Prevention and Outbreak Response



**Better food safety begins
and ends with better data.**



Phone



Directions



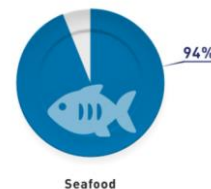
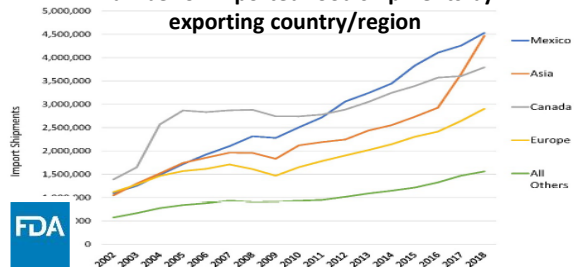
Weather

Predictive Analytics



Using AI to Prevent Violative Imported Seafood

Number of imported food shipments by
exporting country/region





Food Safety Culture



Food Safety = Behavior



~~Food Safety Culture~~

What is a Food Safety Culture?



Culture is shared patterns of thought and behavior that characterize a social group, which are learned through socialization processes and persist through time.

**- Social & Behavioral
Foundations of Public Health**

US oil spill inquiry chief slams BP's
'culture of complacency'



GM Recall Probe to Blame Cultural Failings

Columbia Report Faults NASA Culture,
Government Oversight



Boeing's safety culture is 'inadequate' and
'confusing,' new FAA report finds



Food Safety Culture



Who Creates Culture?

“Organizational cultures are created by leaders, and one of the most decisive functions of leadership may well be the creation, the management, and – if and when necessary – the destruction of culture.”

**- Edgar Schein
Organizational Expert**



**“Food safety culture
is a choice.”**

**- Frank Yiannas
Food Safety Culture, 2009**

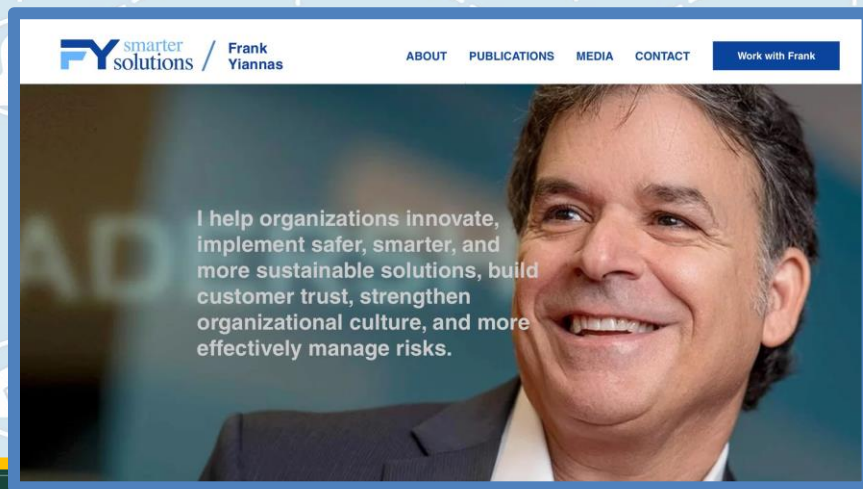
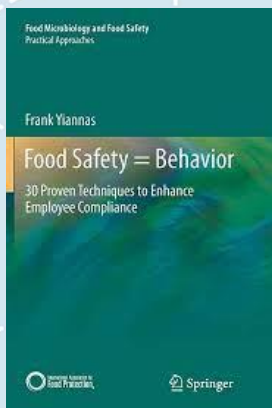
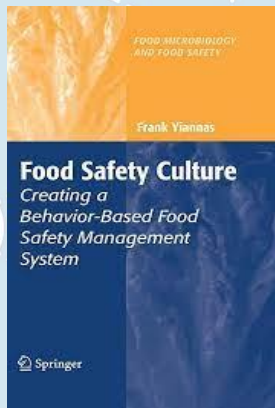


How Do You Create a Food Safety Culture?

Traditional Food Safety Management	Behavior-Based Food Safety Management
<ul style="list-style-type: none">• Focuses on processes.	<ul style="list-style-type: none">• Focuses on processes and people.
<ul style="list-style-type: none">• Primarily based on Food Science.	<ul style="list-style-type: none">• Based on Food Science, Behavioral Science, and Organizational Culture.
<ul style="list-style-type: none">• Simplistic view of behavior change.	<ul style="list-style-type: none">• Behavior change is complex.
<ul style="list-style-type: none">• Linear cause and effect thinking.	<ul style="list-style-type: none">• Systems thinking.
<ul style="list-style-type: none">• Creates a food safety program.	<ul style="list-style-type: none">• Creates a food safety culture.

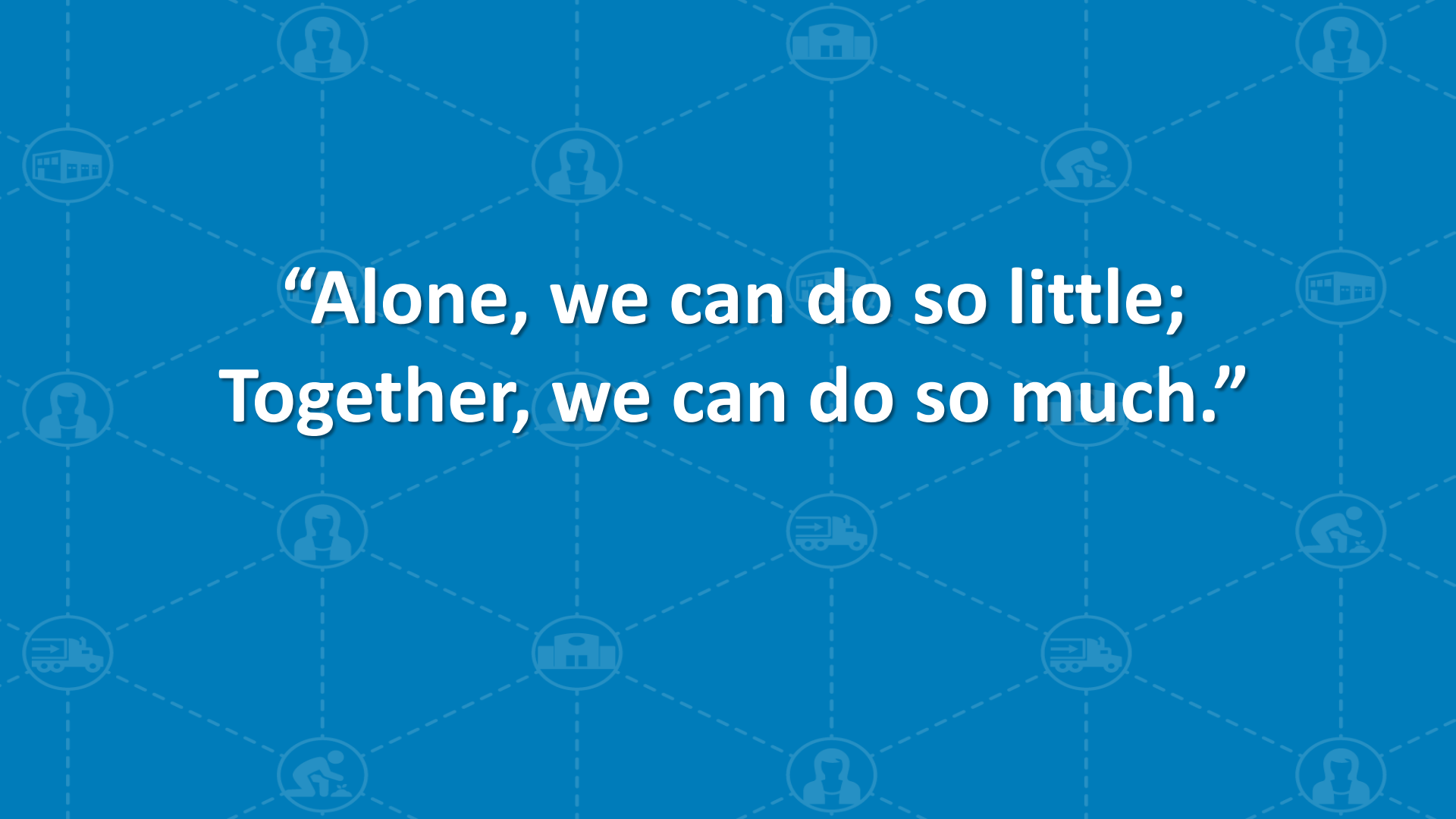


Let's Stay Connected



www.frankyiannas.com





**“Alone, we can do so little;
Together, we can do so much.”**