

Food Safety & The Way Forward: High Tech or High Touch?



Frank Yiannas
Vice President - Food Safety
Walmart

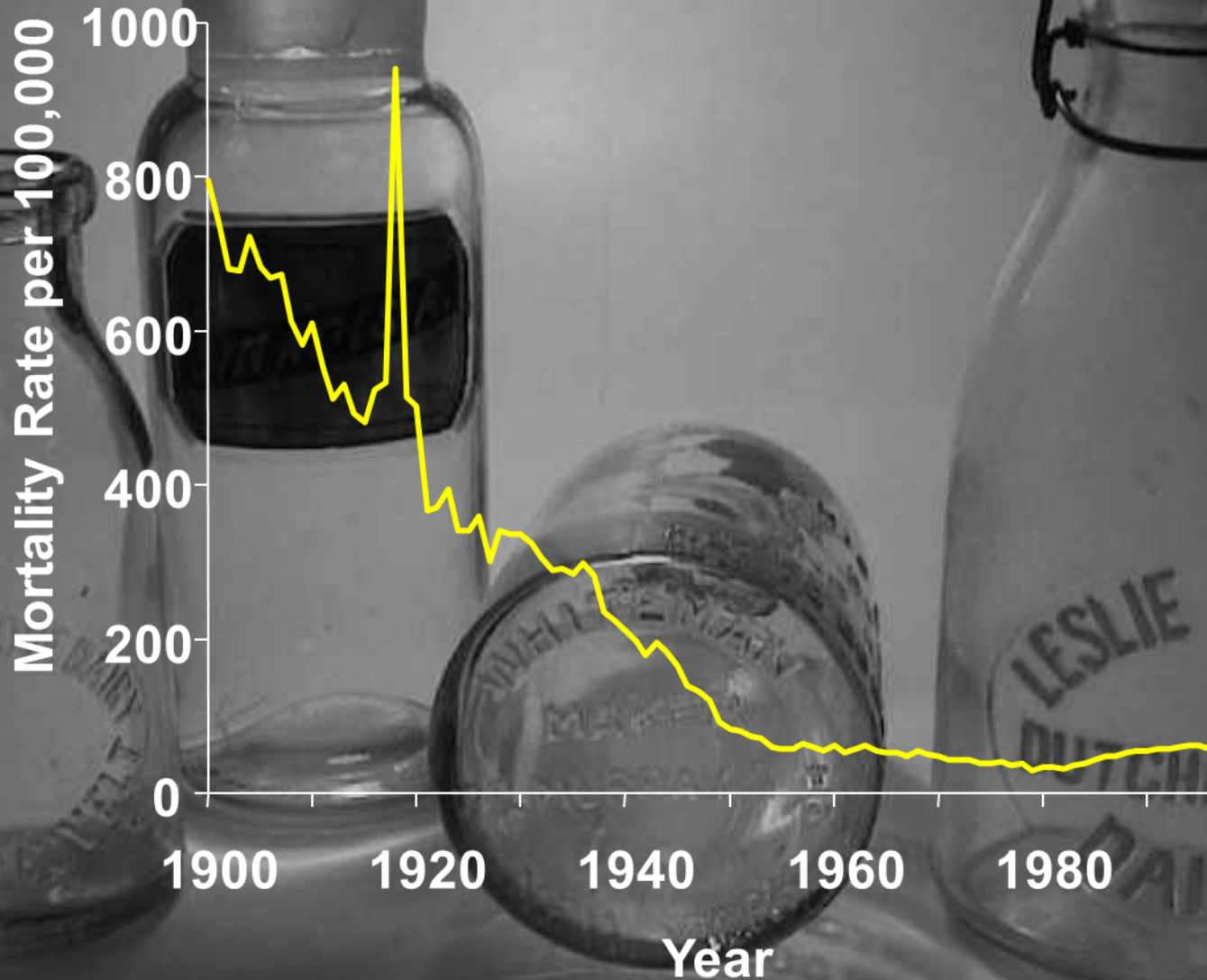
**“A safer future food system
is not a matter of chance.
It is a matter of choice.”**

**- Frank Yiannas
DIFSC 2014**

A grayscale scanning electron micrograph (SEM) showing numerous rod-shaped bacteria, likely Escherichia coli, scattered across the frame. The bacteria are oriented in various directions, some appearing in sharp focus while others are blurred in the background, creating a sense of depth. The lighting highlights the texture of the bacterial surfaces.

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

Infectious Disease Mortality, U.S., 1900-1996



Source: Armstrong et al, JAMA 1999

Foodborne Pathogens 1900 - 1939

Amoebiasis

Botulism

Brucellosis

Cholera

Hepatitis

Salmonellosis

Scarlet fever (streptococcus)

Staphylococcal food poisoning

Tapeworms

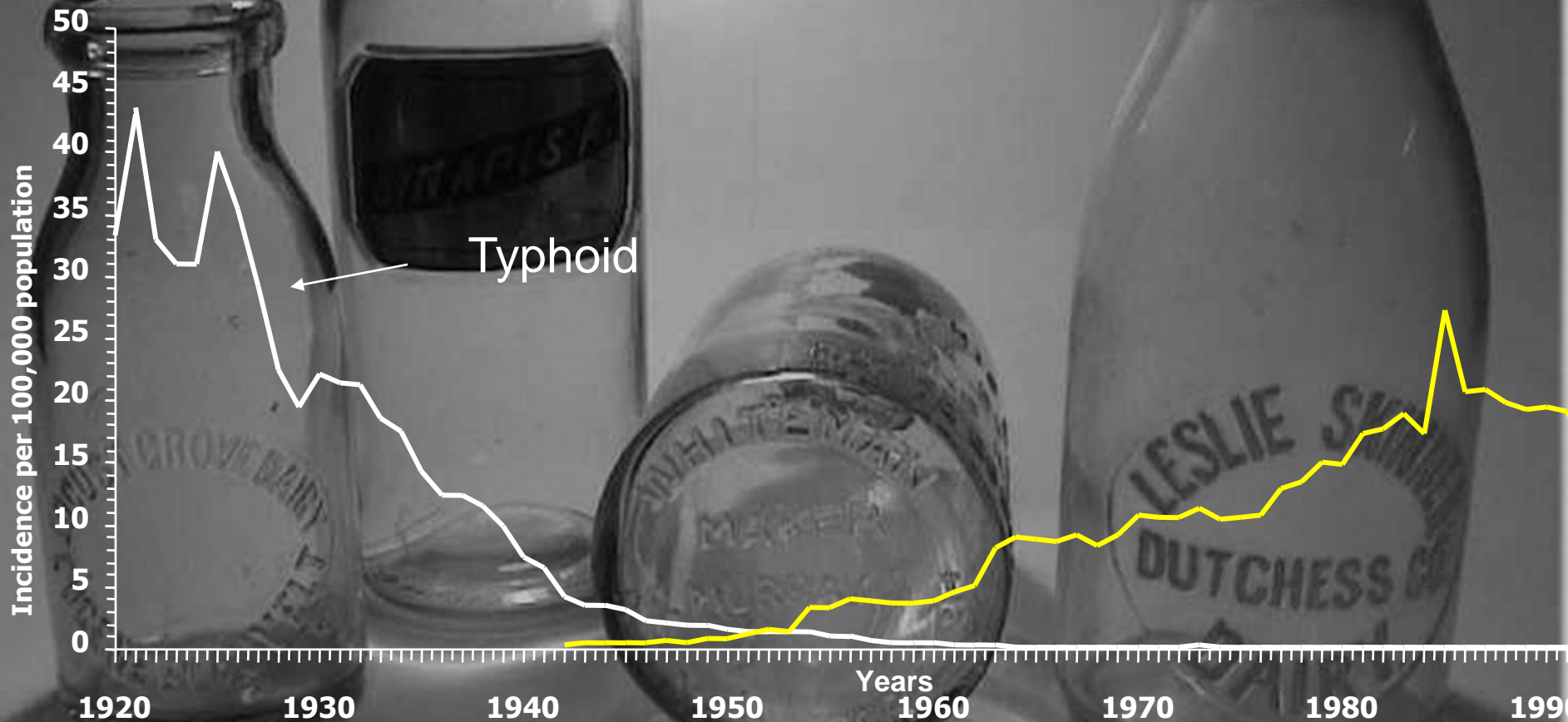
Trichinosis

Tuberculosis, bovine

Typhoid fever

Emergence of non-typhoid *Salmonella* infections

USA, 1920-1997



Source : CDC, National surveillance data



147 Cases
33 Deaths



3,930 Cases
53 Deaths



EPIDEM

Are we 'currently' winning?

FOOD SAFETY



Disease Agents	Percentage change in 2013 compared with 2006–2008		2013 rate per 100,000 Population	2020 target rate per 100,000 Population	CDC estimates that...
<i>Campylobacter</i>		 13% increase	13.82	 8.5	For every <i>Campylobacter</i> case reported, there are 30 cases not diagnosed
<i>Escherichia coli</i> O157		No change	1.15	 0.6	For every <i>E. coli</i> O157 case reported, there are 26 cases not diagnosed
<i>Listeria</i>		No change	0.26	 0.2	For every <i>Listeria</i> case reported, there are 2 cases not diagnosed
<i>Salmonella</i>		No change	15.19	 11.4	For every <i>Salmonella</i> case reported, there are 29 cases not diagnosed
<i>Vibrio</i>		 75% increase	0.51	 0.2	For every <i>Vibrio parahaemolyticus</i> case reported, there are 142 cases not diagnosed
<i>Yersinia</i>		No change	0.36	 0.3	For every <i>Yersinia</i> case reported, there are 123 cases not diagnosed

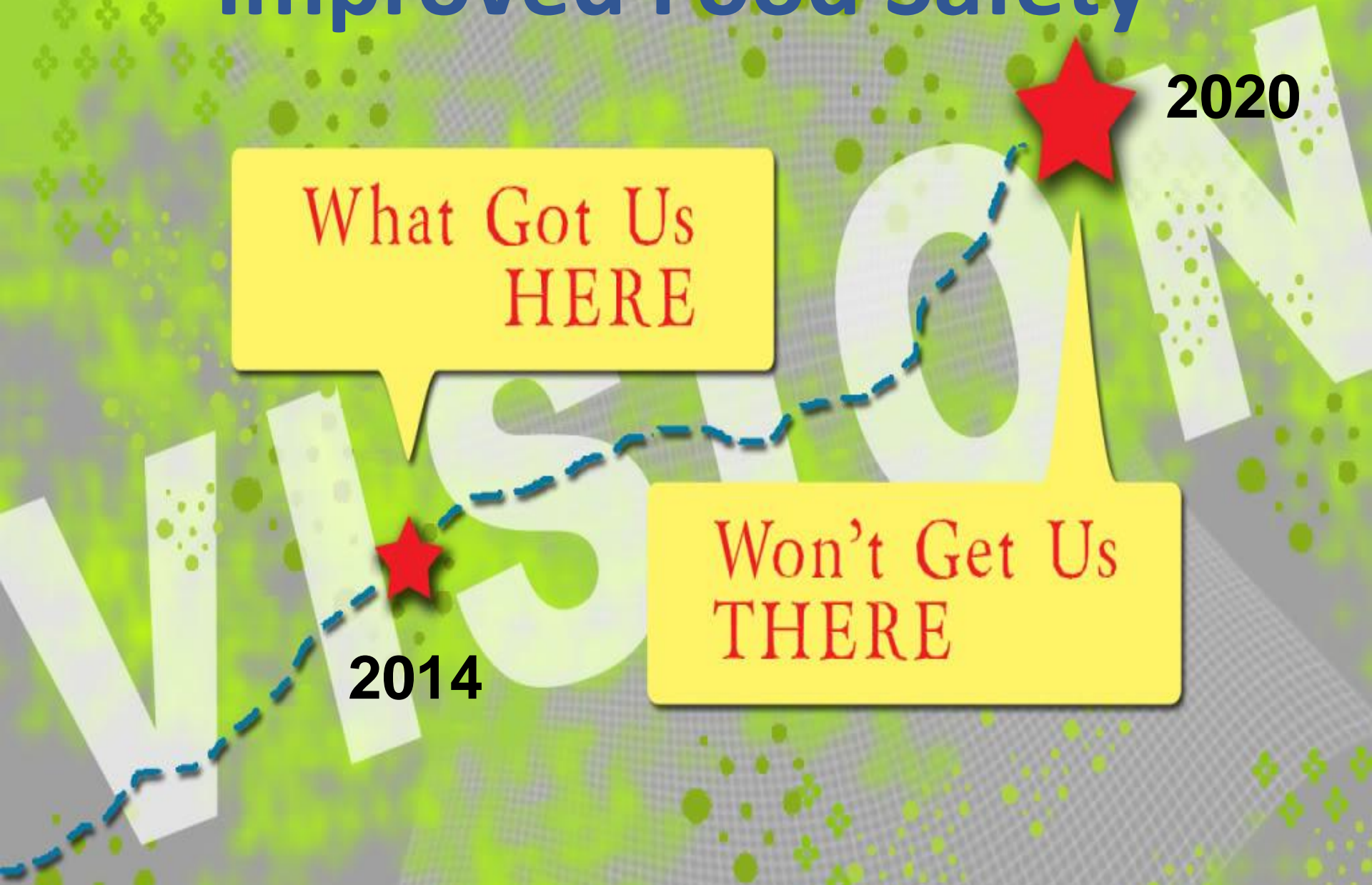


U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

For more information, see <http://www.cdc.gov/foodnet/>

Preliminary FoodNet 2013 Data

Improved Food Safety



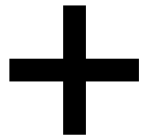
2020

What Got Us
HERE

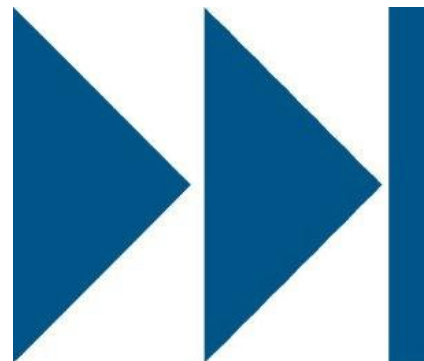
2014

Won't Get Us
THERE

Changing Food System
Foodborne Surveillance
Global Population
Emerging Pathogens
Human Behavior
Social Media



Challenges to the Food Safety



**The Way
Forward**

The Way Forward?

High Tech

derived from the Greek word, *technologia* . It means technology that is at the cutting edge - the most advanced technology currently available.

High Touch

a term coined by Naisbitt in the 1980s. It refers to human and social elements instead of technology.



Information Technology



Using Information Technology

Rotisserie Chicken Example



4% Salmonella
71% Campylobacter

Paper to Digital



Club/Store _____ Date / / 20__

Daily Temperature Log

Cook Temperatures

Rotisserie Area Cook Temps (Min 160°)				All other cooked items (Min 165° F)											
Item	Time	Temp	Initials	Item	Time	Temp	Initials	Item	Time	Temp	Initials	Item	Time	Temp	Initials

Hot Holding Temperatures (Min 140° F)								Time Check			
Time	Item	Temp	Initials	Time	Item	Temp	Initials	Time	Item	Temp	Initials
10 am-12 pm				10 am-12 pm				10 am-12 pm			
2 pm-4 pm				2 pm-4 pm				2 pm-4 pm			
6 pm-8 pm				6 pm-8 pm				6 pm-8 pm			

Manager Verification

Cold Temperatures (Max 41° F)

Time	Item	Temp	Initials	Time	Item	Temp	Initials	Time	Item	Temp	Initials
8 am-10 am				8 am-10 am				8 am-10 am			
4 pm-6 pm				4 pm-6 pm				4 pm-6 pm			

VISUALLY OBSERVE TO ANSWER ALL QUESTIONS

High Five No. 1 - Be Clean, Be Healthy	Initials	Time	Manager Initials
• Are associates using gloves or utensils to prevent contact with ready-to-eat foods?			
• Are hand washing stations stocked, accessible, and clean?			
High Five No. 2 - Keep It Cold, Keep It Safe			
• Are refrigerated cold holding units clean and in good working order?			
• Are refrigerated cold holding units set at 41° F or below? Is air flow not restricted?			
• Are refrigerated cold holding units clean and in good working order?			
High Five No. 3 - Don't Cross Contaminate			
• Are raw foods stored below and away from ready-to-eat foods?			
High Five No. 4 - Wash, Rinse, & Sanitize			
• Is sanitizer being dispensed at correct concentration?			
• Is sanitizer being used correctly?			
• Test strips available?			
High Five No. 5 - Cook It & Chill It			
• Are foods being cooked to correct minimum internal temperature?			
• Are foods chilled correctly?			

Corrective Actions

Closing Manager Signature:

Retain Log 6 Months
See Instructions Page



“Data on a piece of paper is a dead end; data in digital form is the start of meaning action.”

- Bill Gates





How SPARK Works



Paradigm Shift

An iceberg floating in the ocean. The tip of the iceberg is visible above the water line, while the much larger, submerged part is below. The sky is blue with light clouds, and the water is a deep blue.

10 regulatory inspections

100 3rd party food safety audits

1,400,000 SPARK rotisserie chicken temps

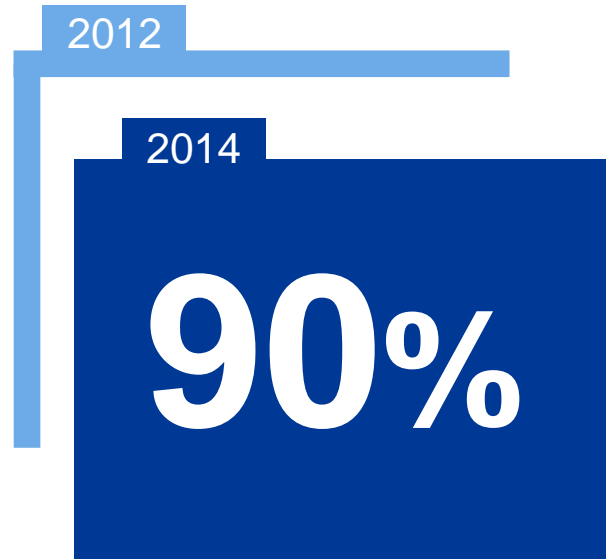
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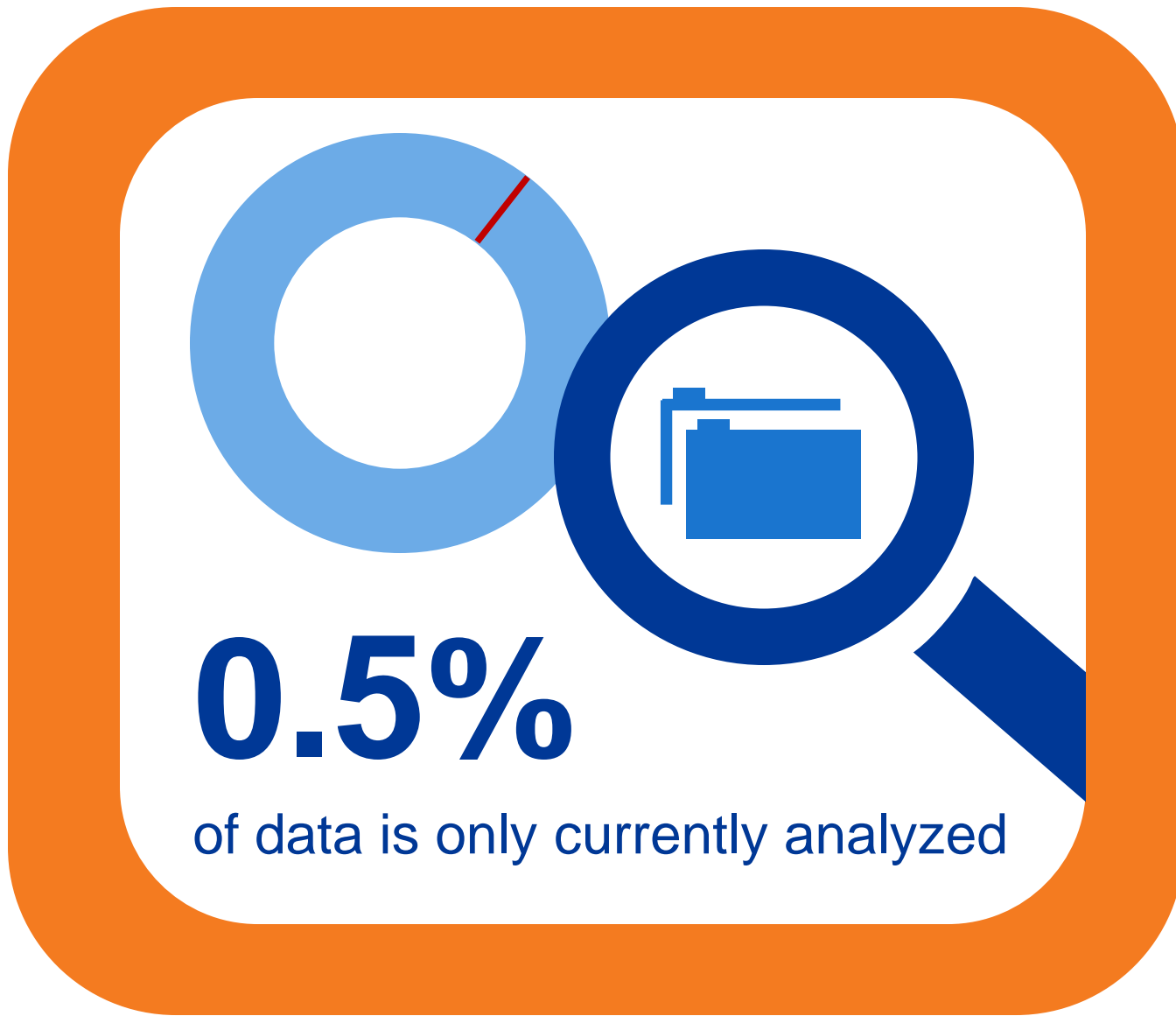
Big Data



Big Data



of the data that exists today
was created in the last 2
years



Big data: an all-encompassing term for any collection of data sets so large and complex that it becomes difficult to process using on-hand data management tools or traditional data processing applications.

The Surveillance Pyramid

Reported to health dept or CDC



Culture-confirmed case



Lab tests for organism



Specimen obtained



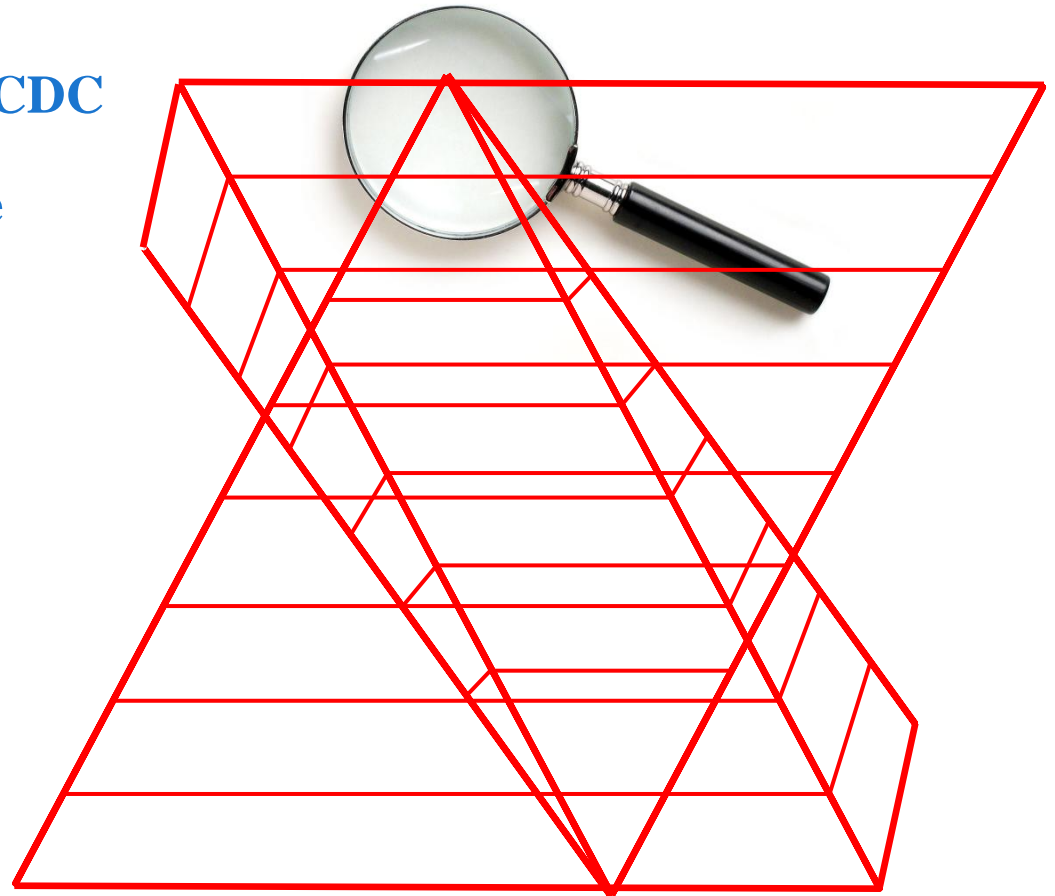
Person seeks care



Person becomes ill



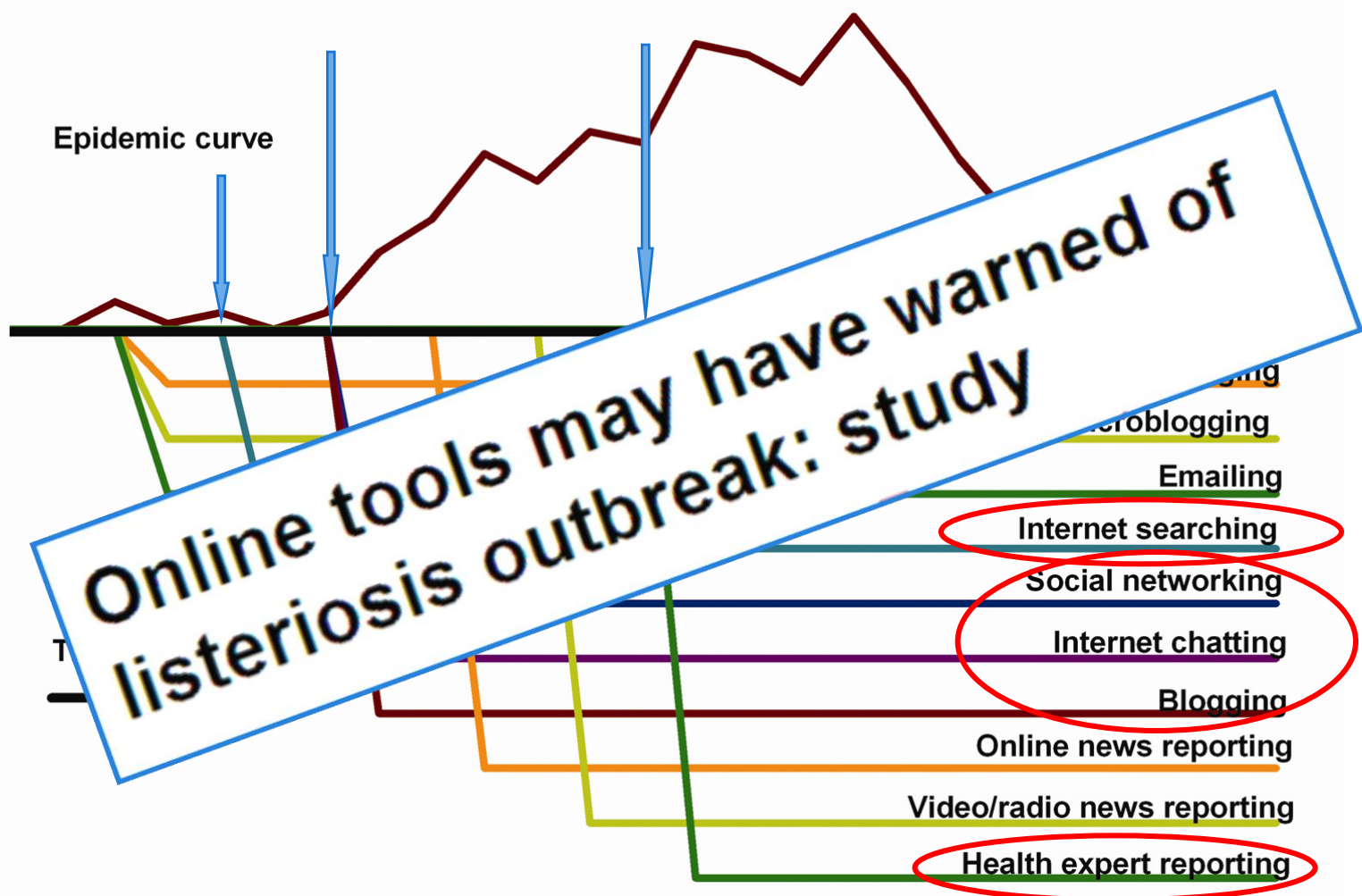
Population



Google



Infodemiology



All-Sourcing

Source: *Use of unstructured event-based reports for global infectious disease surveillance. Emerg Infect Dis 2009 May*

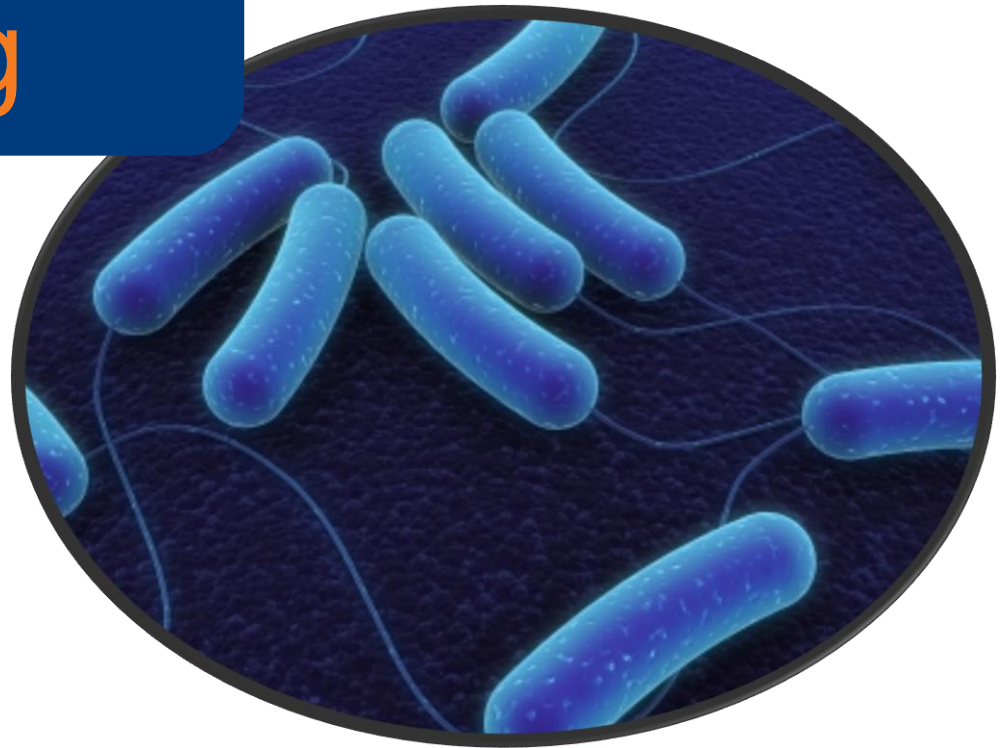


Yelp helped NYC find unreported food borne illness: report

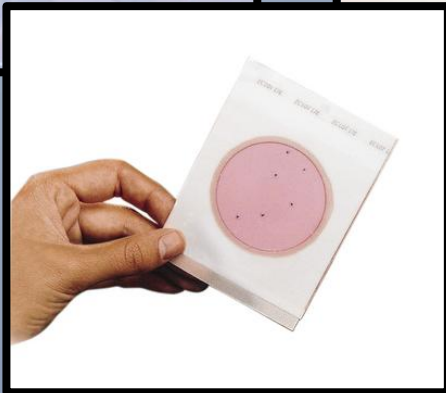




Microbiological Testing



Changing Food Micro Laboratory



Microbiological Testing (N-60)



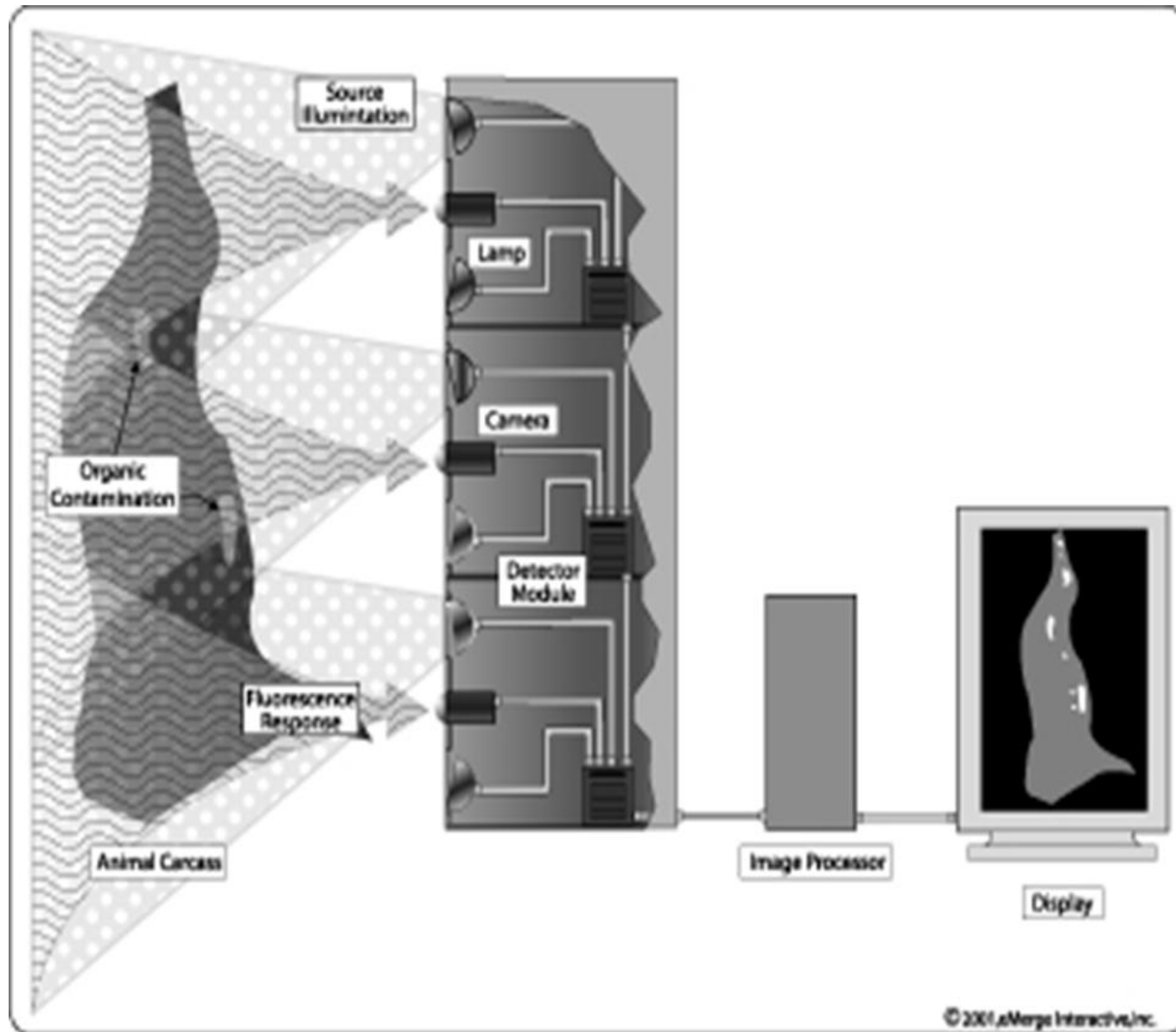
“A consuming public will always be more sensitive than a sampling plan.”

How Many Patties Do You Have to Test?

99% Confidence



New & Real-Time Tests for New Times









The Way Forward?

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High Touch

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Food Safety Leadership



Food Safety Management vs Food Safety Leadership

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Welcome to the HACCP, **Food Safety Management** web site. HACCP means Hazard Analysis Critical Control Points. HACCP can be used in restaurants, school food ...
cals.arizona.edu/manicopa/fcs/haccp/index.htm - 8k - [Cached](#) - [Similar pages](#)

ISO 22000 Food Safety Management Library
ISO 22000 2005 is a **food safety management** standard. Use it to certify your organization.
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US FDA/CFSAN - Table of Contents, Managing Food Safety: A...
Evaluating Existing **Food Safety Management** Systems; Determining Process Flows; The Hazard Analysis; Determining Risk Factors in Process Flows ...
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Advanced Food Safety Management
Registered RIPHH **food safety** training centre for Primary, HACCP Principles and Certificate in Food Hygiene and **Safety** courses.
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Canadian Food Safety Management
Canadian Food Safety **Management** is the first and only Canadian trade publication dedicated exclusively to the Canadian **food safety** industry. ...
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Food Standards Agency - Safer food, better business
This **food safety management** pack has been developed to help small catering businesses such as restaurants, cafes and takeaways comply with new regulations ...
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Safety Leadership Sponsored Link
www.qualitysafetyedge.com/ Adopt the behavioral Values-Based **Safety** Process at your company!

NSF International : Newsroom : Food Safety Leadership Awards Program
[2008 **Food Safety Leadership Award Logo**] NSF International is very pleased to announce its call for nominations for the 2008 NSF **Food Safety Leadership Awards** ...
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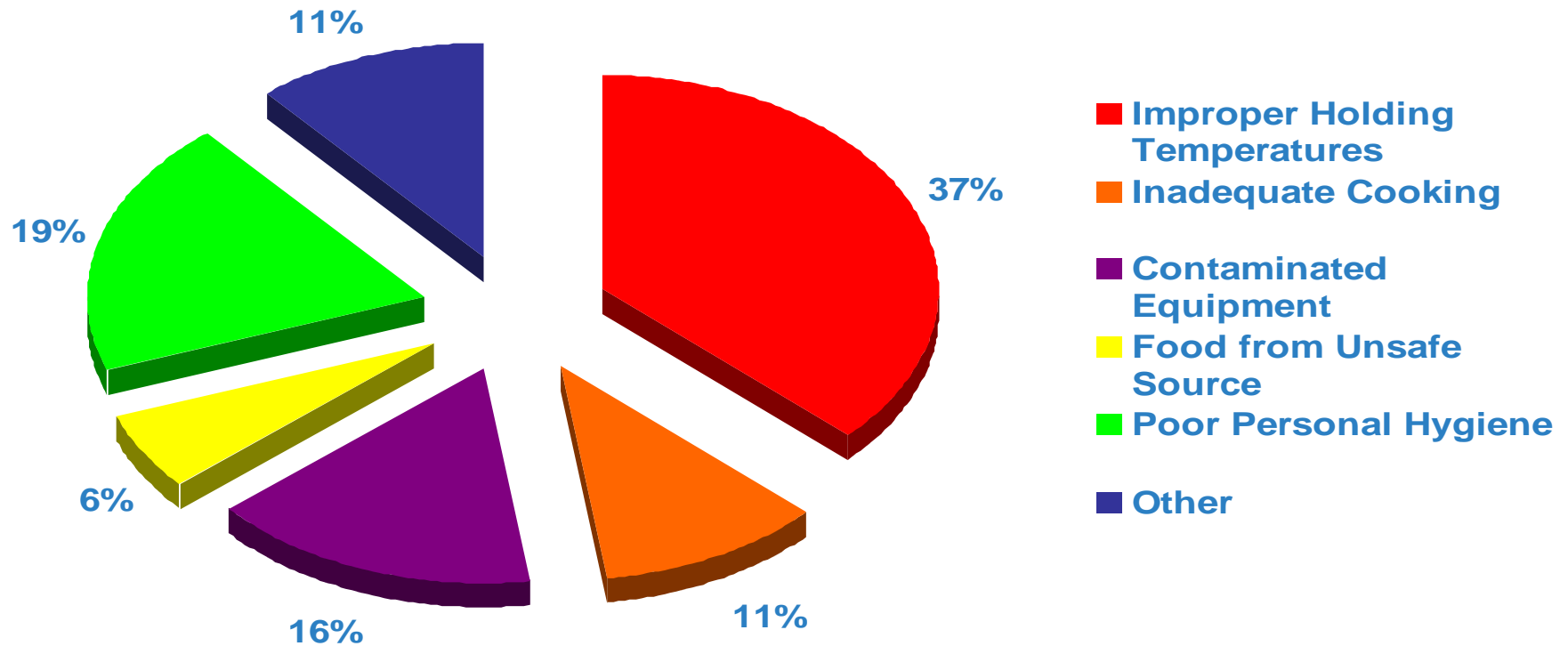
2007 NSF Food Safety Leadership Award Nominations Open ...
QSRmagazine.com is the leader for news and information about the quick-service and fast casual restaurant industry. QSR - How America Eats!
www.qsrmagazine.com/articles/news/story.phtml?id=5216 - 33k - [Cached](#) - [Similar pages](#)



Behavior



Number of Foodborne Disease Outbreaks by Contributing Factor, CDC, U.S.



Food Safety = Behavior

Traditional Food Safety Strategies



- **Training**

- **Inspections**

- **Micro Testing**

“If the only tool you have is a hammer, you tend to see every problem as a nail.”

A grayscale image of a hammer and three nails. The hammer is positioned diagonally across the frame, with its head pointing towards the top left. Three nails are scattered in the lower-left area, some overlapping each other. The background is plain white.

**- Abraham Maslow
Psychologist
1908 - 1970**

Food Science + Behavioral Science

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.

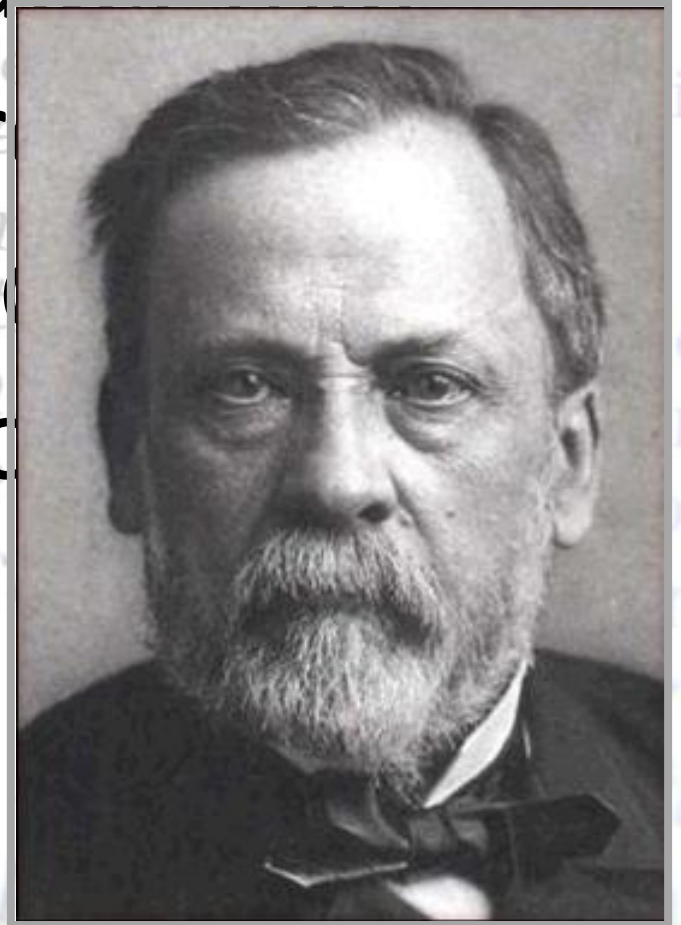
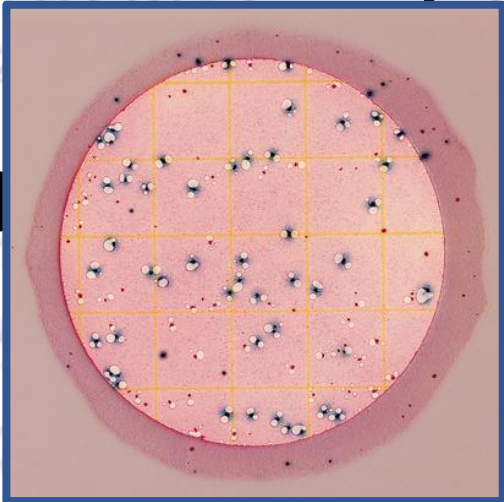


Innovation



Food Safety Innovation: a new idea, practice, or product that results in safer food, reduced burden of foodborne illness, and improved quality of

HACCP



The Way Forward?

High Tech

- Information Technology
- Big Data & Social Media
- Food Micro Testing

High Touch

- Leadership
- Human Behavior
- Innovation



“In our view, the NASA organizational culture had as much to do with this accident as the foam.”

- Columbia Accident Investigation Board (2003)

Future of Food Safety



at a Crossroad

on twitter @frankyiannas