



International Association for
Food Protection®

5 GLOBAL FOOD SAFETY TRENDS WHAT YOU NEED TO KNOW



**In order to prepare for
the future, we must
understand and learn
from the past.**

THE HISTORY OF FOOD PROCESSING

- **2000 B.C.** - Here, eat this food quickly before it spoils.
- **500 B.C.** - That food spoils fast. Here, salt it.
- **1845 A.D.** - That salt tastes bad. Here, place that food on ice.
- **1850 A.D.** - That ice melts fast. Here, place that food in a refrigerator.
- **1864 A.D.** - That food still spoils. Here, pasteurize it.
- **1980 A.D.** - That pasteurized food doesn't last long enough. Here, irradiate it.
- **1997 A.D.** - That irradiated food is bad for you. Here, eat this "all natural fresh" stuff.
- **2000 A.D.** - That "all natural fresh" stuff goes bad. Here, eat this food quickly before it spoils.

**Seeing the future is good,
but preparing for it and
shaping it is
even better.**

IN THE NEWS

Inquiry into salmonella outbreak

Health experts are banding together to trace the source of a rare form of salmonella which has affected dozens of people throughout Britain.

Source of tainted spinach finally pinpointed

Calif. ranch likely responsible for E. coli outbreak that killed 3 people

Salmonella Outbreak Causes Peanut Butter Recall

Thursday, February 16, 2007
Associated Press

Japan Confectioner Resigns Amid Scandal

Tuesday January 16, 2007
By YURI KAGEYAMA, AP Business Writer

China's food safety woes now a global concern

Pet food crisis focuses attention on frightening potential health hazards

Food safety a big problem worldwide: WHO officials

Tue Jul 17, 2007 1:09PM EDT



BBC NEWS

SKY NEWS

CNN



Food Safety is a Global Problem



**Which Can Benefit from
Collaborative Solutions**

A faded, light blue map of South America and the Caribbean region serves as the background. The map shows major countries like Mexico, Venezuela, and Peru, along with various cities and geographical features. The text is overlaid on a dark blue horizontal band across the top of the image.

TREND # 1: FOODBORNE DISEASE SURVEILLANCE

**To prepare for the future of
food safety, prevention must
outpace detection.**

THE RACE



Public Health Detection



Industry Prevention

ESTIMATE OF ANNUAL FOODBORNE DISEASE WORLDWIDE



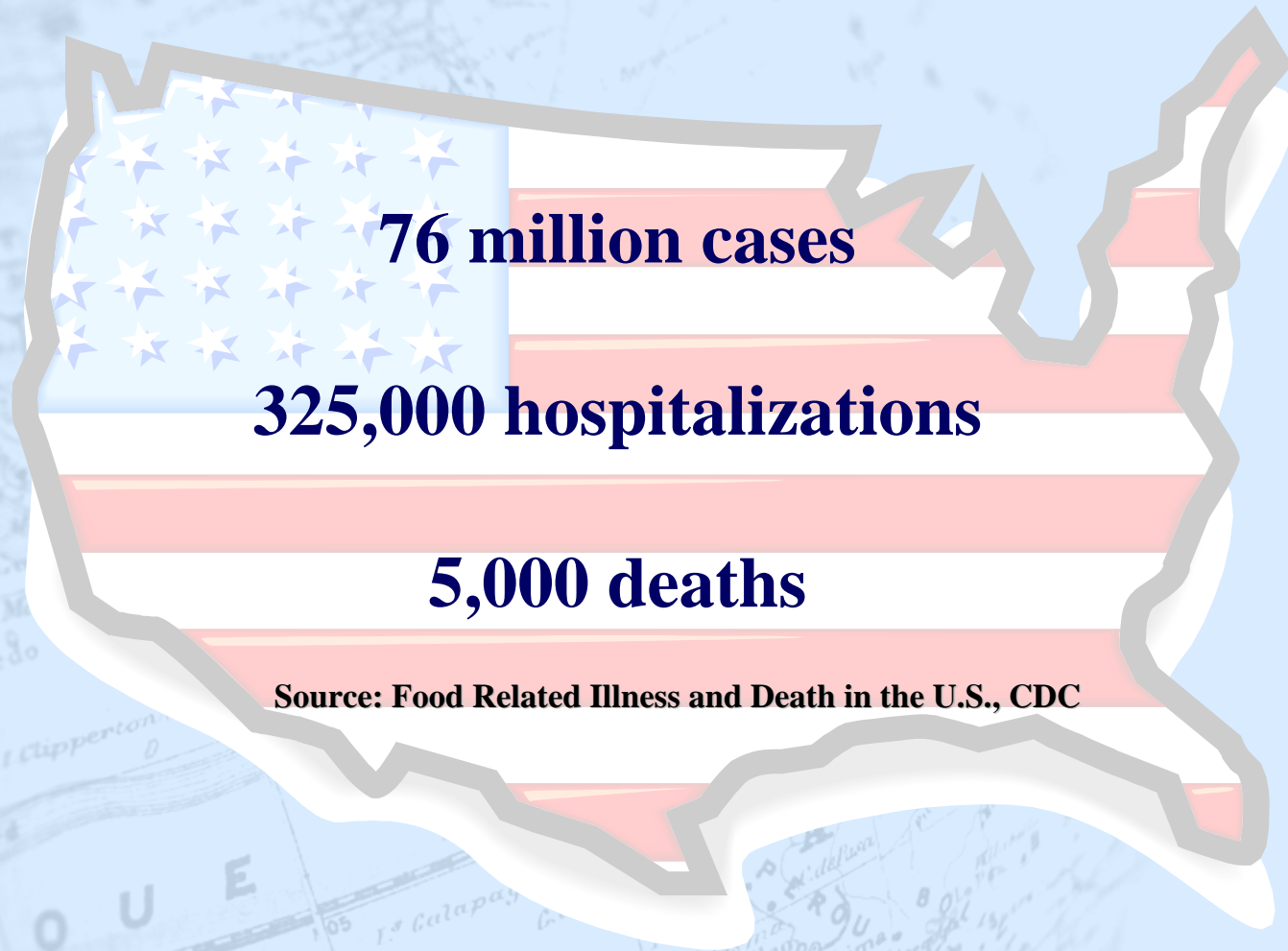
2 billion cases

1/3 of the global population

1.8 million deaths

Source: World Health Organization

ESTIMATE OF FOODBORNE DISEASE PER YEAR IN THE U.S.



THE SURVEILLANCE PYRAMID

Reported to health dept. / CDC



Culture-confirmed case



Lab tests for organism



Specimen obtained



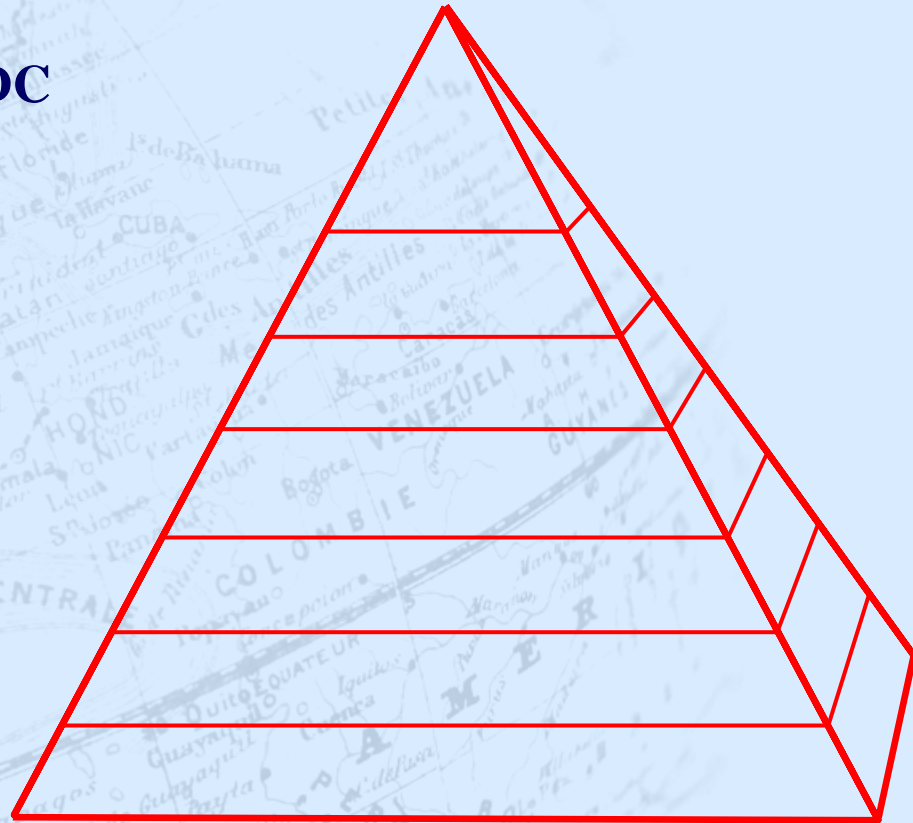
Person seeks care



Person becomes ill



Exposure in Population



FROM 1993 TO 1997, WHAT WAS THE MOST COMMON ETIOLOGY OF FOODBORNE OUTBREAKS REPORTED TO CDC?

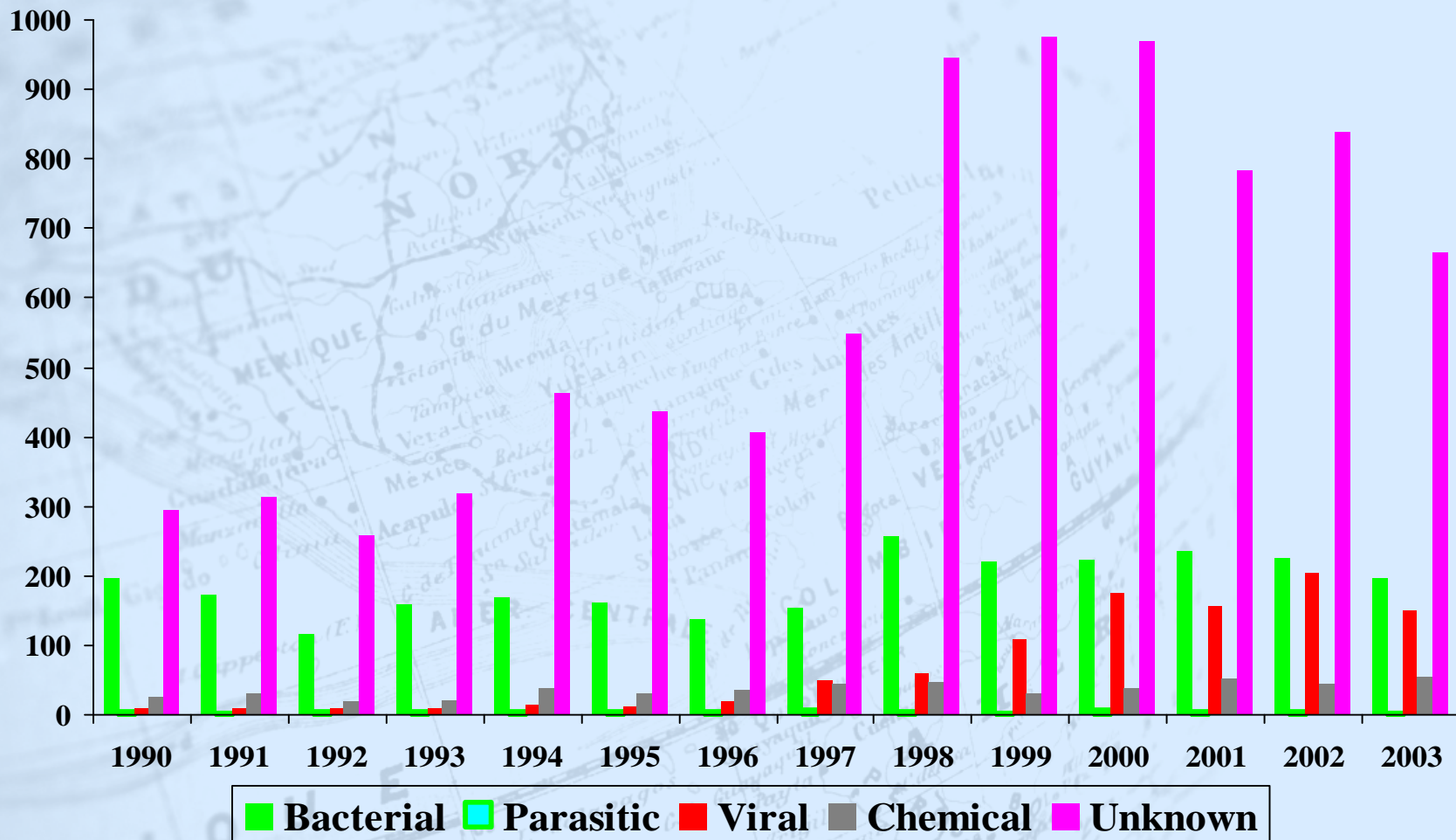
- **Campylobacter**
- **E. coli**
- **Listeria**
- **Norwalk-like**
- **Salmonella**
- **Unknown**

FROM 1993 TO 1997, WHAT WAS THE MOST COMMON ETIOLOGY OF FOODBORNE OUTBREAKS REPORTED TO CDC?

N = 2751

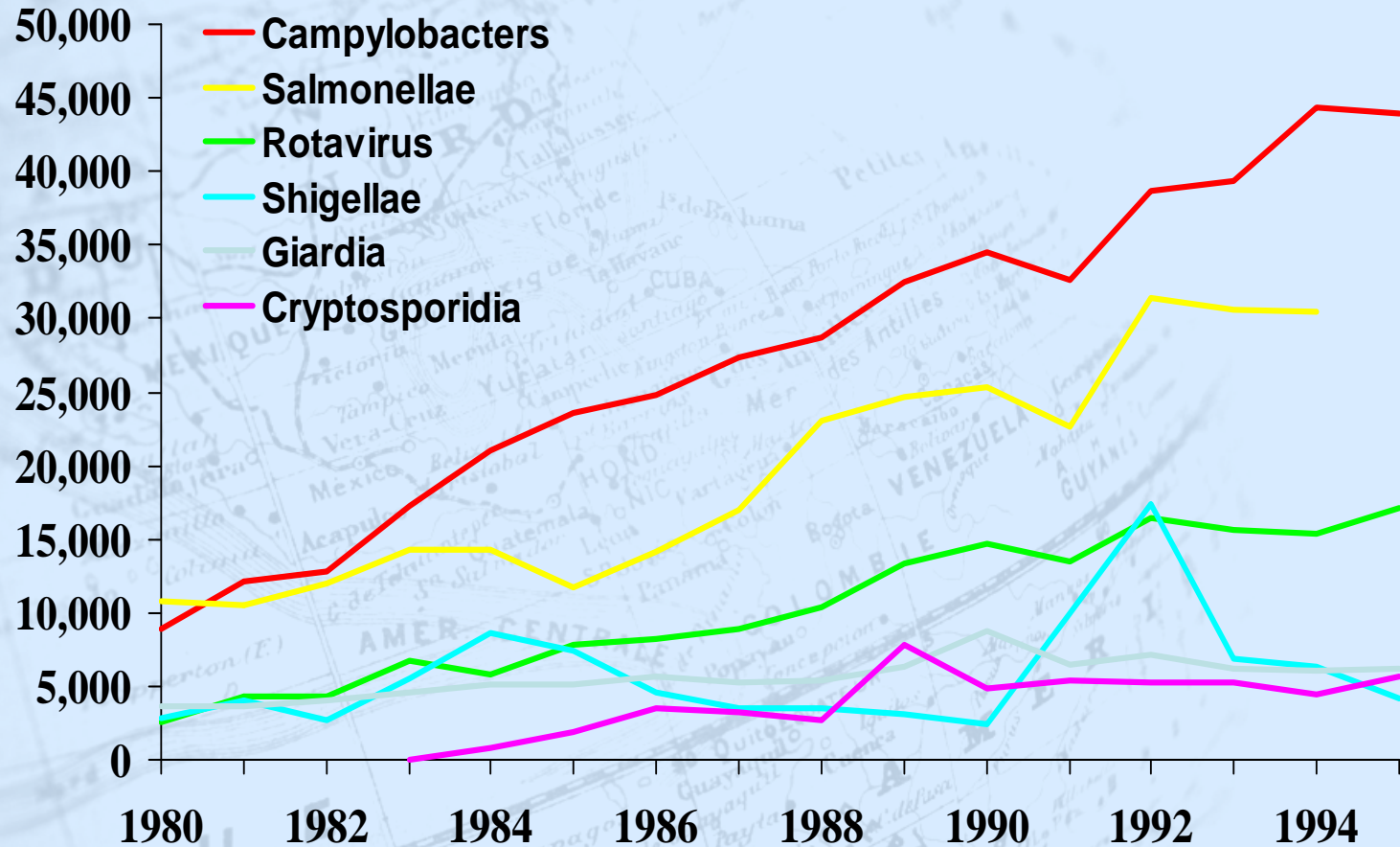
- **Campylobacter** 25 (0.9%)
- **E. coli** 84 (3.1%)
- **Listeria** 3 (0.1%)
- **Norwalk-like** 9 (0.3%)
- **Salmonella** 357 (13%)
- **Unknown** 1873 (68.1%)

OUTBREAKS OF FOODBORNE ILLNESS IN THE USA BY ETIOLOGY



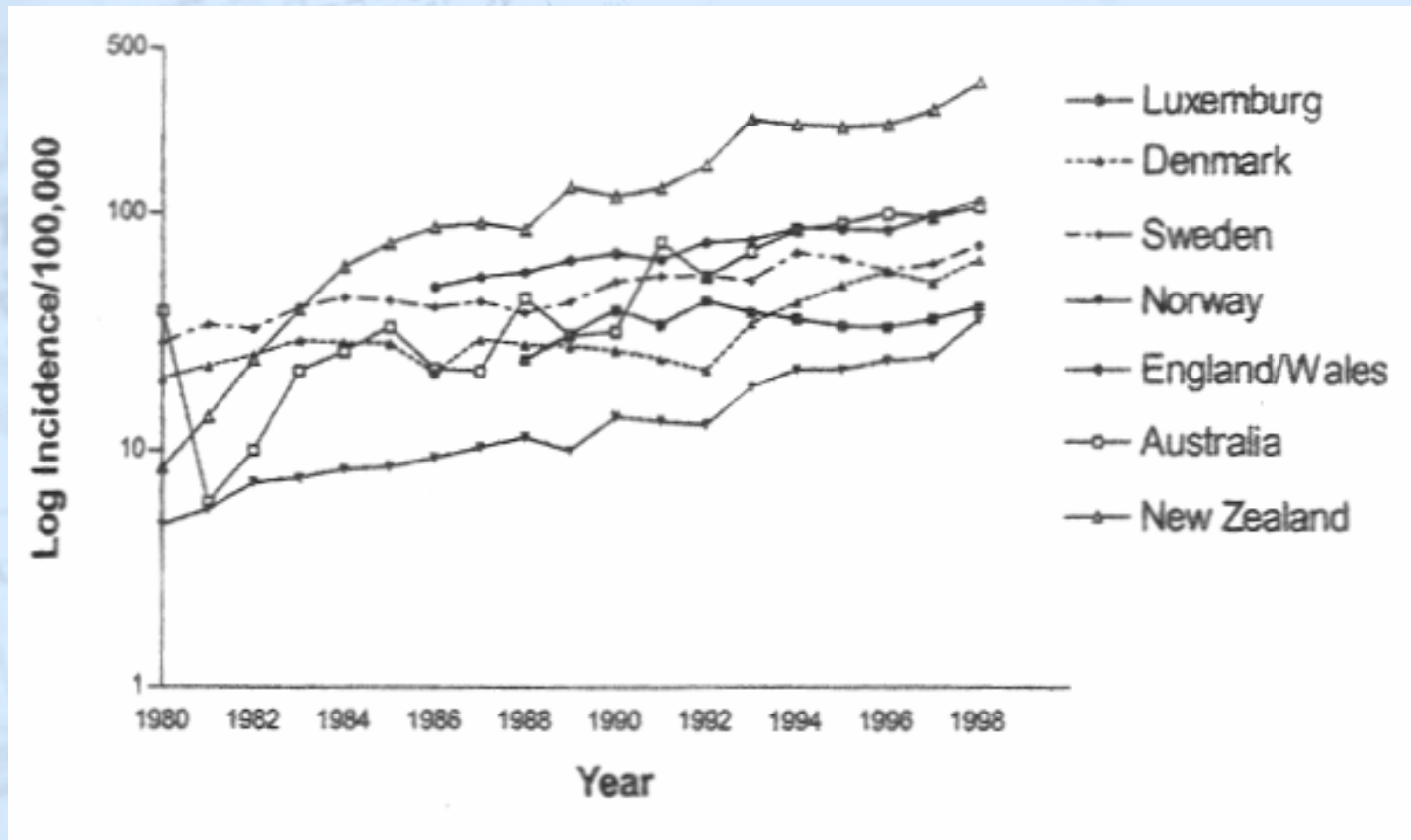
Source: Foodborne Outbreak Reporting System
http://www.cdc.gov/ncidod/dbmd/outbreak/us_outb.htm

FOODBORNE DISEASES ENGLAND & WALES

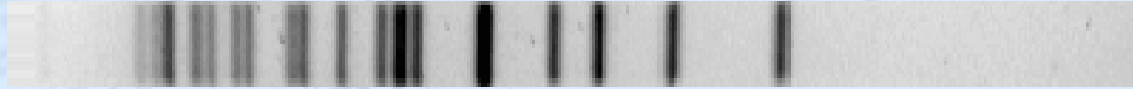


CAMPYLOBACTER INFECTIONS IN SOME DEVELOPED NATIONS

1980-1998



MOLECULAR SUBTYPING



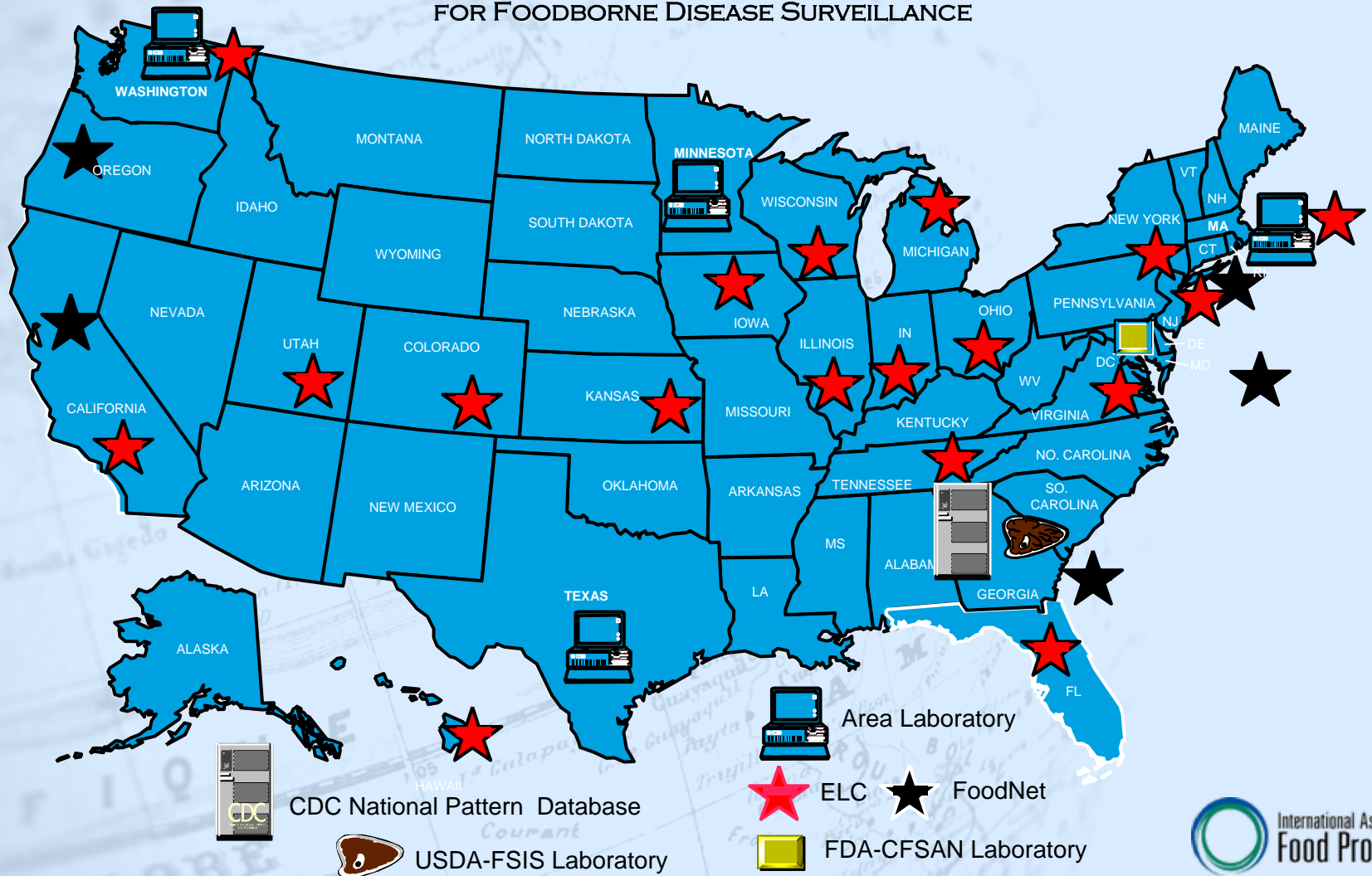
"DNA Fingerprinting"

Identifies hundreds of different strains

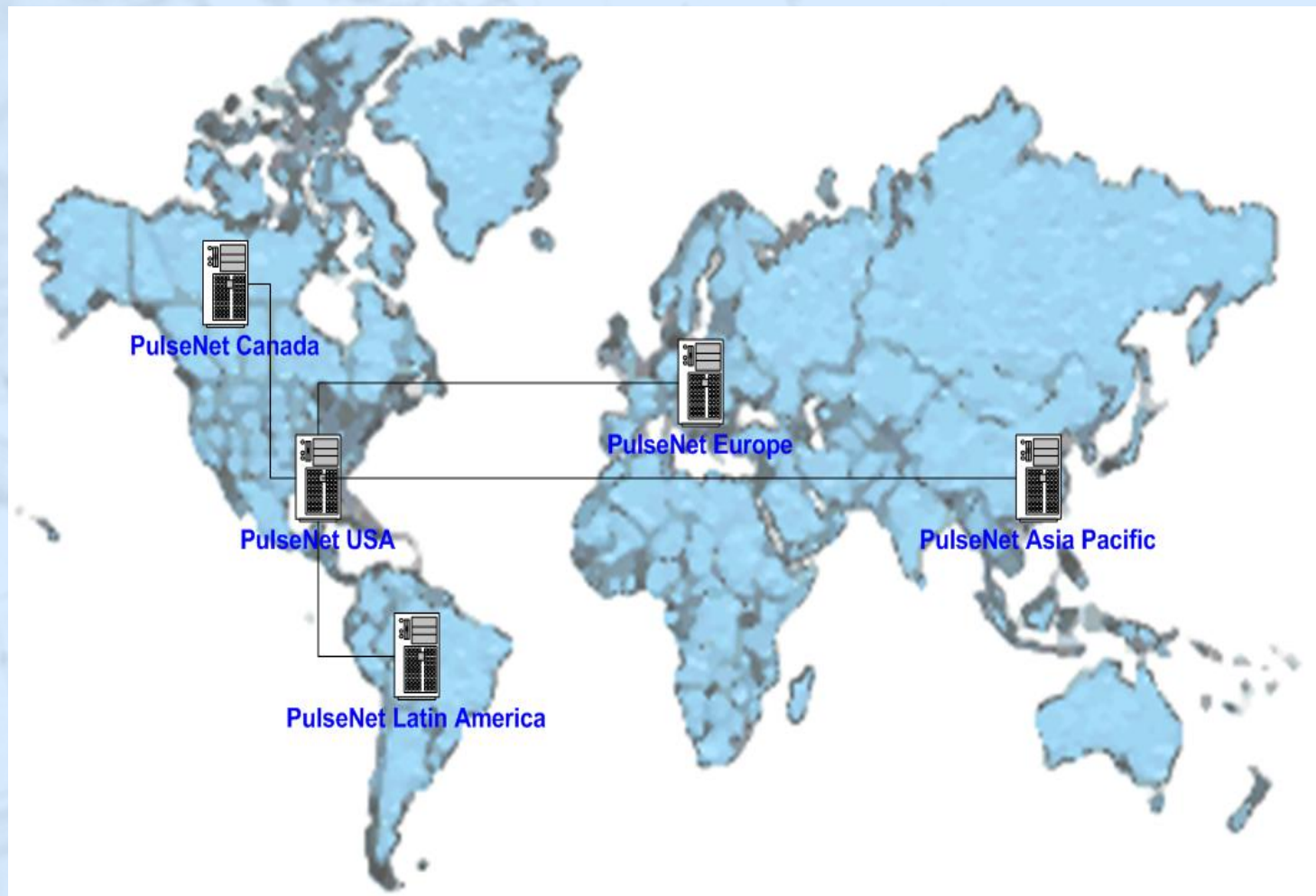
Can be scanned and transmitted electronically

PULSE NET

THE NATIONAL MOLECULAR SUBTYPING NETWORK FOR FOODBORNE DISEASE SURVEILLANCE



PULSENET INTERNATIONAL



FUTURE OF FOODBORNE DISEASE SURVEILLANCE

Increased likelihood of:

- **Detecting seemingly unrelated illnesses**
- **Identifying responsible food vehicles & country of origin**
- **Discovering non-traditional food vehicles**
- **Determining the point of contamination**
- **Identifying the contributing factors**
- **Shifting the blame**

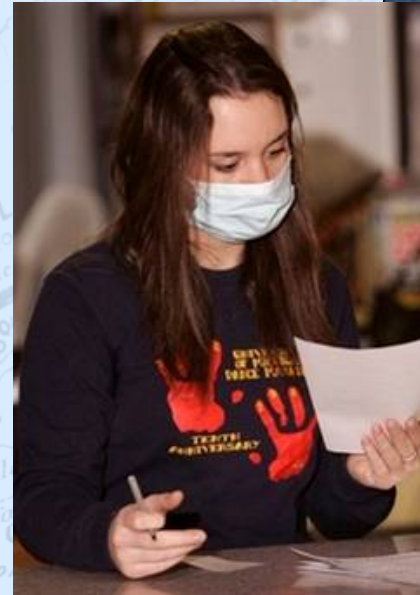
A faded, light blue map of Central and South America serves as the background. The map shows various countries and cities, including Mexico, Central America, and South America. The text is overlaid on this map.

TREND #2: UNEXPECTED WORLD EVENTS

To prepare for the future of food safety, expect the unexpected.

CURRENT ISSUES IN FOOD SAFETY

- Prions
- Genetically modified foods
- Food defense
- Avian Influenza, H5N1



PREPARING FOR THE UNEXPECTED “CRITICAL SUCCESS FACTORS”

- **Early warning or detection systems**
- **Look for trends and patterns**
- **Continual learning and research**
- **Unlearn what you already know**

“The problem is never how to get new, innovative thoughts into your mind, but how to get old ones out. Every mind is a room packed with archaic furniture. You must get the old furniture of what you know, think, and believe out, before anything new can get in.”

-Dee Hock

PREPARING FOR THE UNEXPECTED “CRITICAL SUCCESS FACTORS”

- **Early warning or detection systems**
- **Look for trends and patterns**
- **Continual learning and research**
- **Unlearn what you already know**
- **Develop multi disciplinary and flexible teams**
- **International collaboration and transparency**
- **Become proficient at responding to change**

A faint, light blue map of South America is visible in the background, showing various countries and cities. The map is centered on the continent, with labels for countries like Mexico, Venezuela, and Peru, and cities like Lima and Callao. The map is overlaid on a dark blue horizontal band.

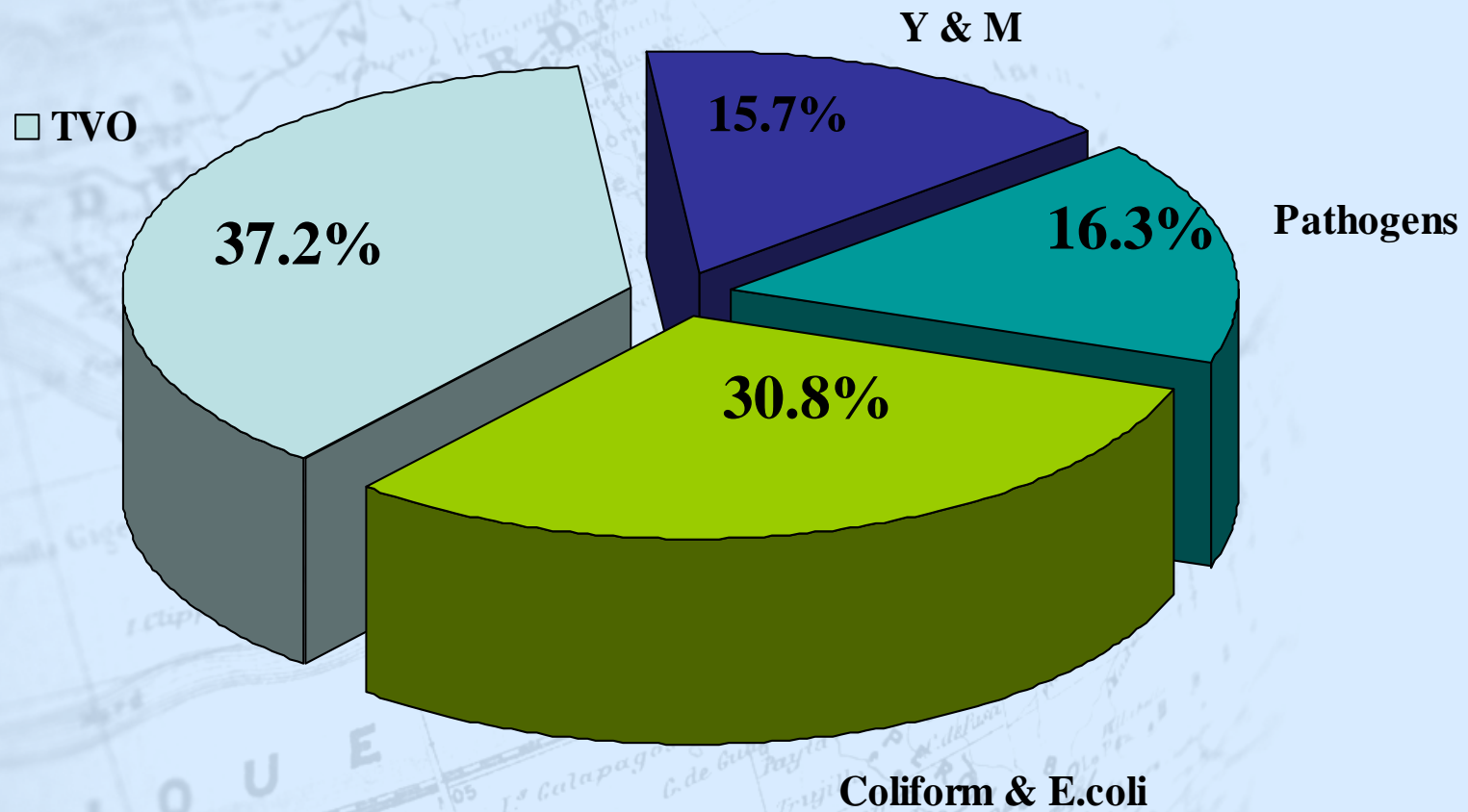
TREND #3: MICROBIOLOGICAL TESTING

To prepare for the future of food safety, expect greater pressure to test and be willing to use better testing methods and approaches.

AMOUNT OF TESTING IS LIKELY TO INCREASE BECAUSE OF:

- **Regulatory initiatives**
- **Customer-supplier requirements**
- **Consumer advocacy groups**
- **Human nature**
- **Concern over specific pathogens**

PATHOGEN TESTING IN THE U.S. FOOD INDUSTRY



Source: Strategic Consulting Inc.

PATHOGEN VERSES INDICATOR TESTING

Which one is better?

**Needles
(pathogens)**

**Haystacks
(fecal indicators)**

PATHOGEN VERSES INDICATOR TESTING

Which one is better?

**Needles
(pathogens)**

**Haystacks
(fecal indicators)**

Yesterday's Lab



Today's Lab



PATHOGEN VERSES INDICATOR TESTING

Which one is better?

**Needles
(pathogens)**

**Haystacks
(fecal indicators)**

PATHOGEN VERSES INDICATOR TESTING

Which one is better?

**Needles
(pathogens)**

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(fecal indicators)**







MICROBIAL INDICATORS PAST & PRESENT

19th Century



21st Century

1892

Schardinger tests water for what is now called *E. coli* instead of testing for *Salmonella*.

“Over 100 years in the making”

2007

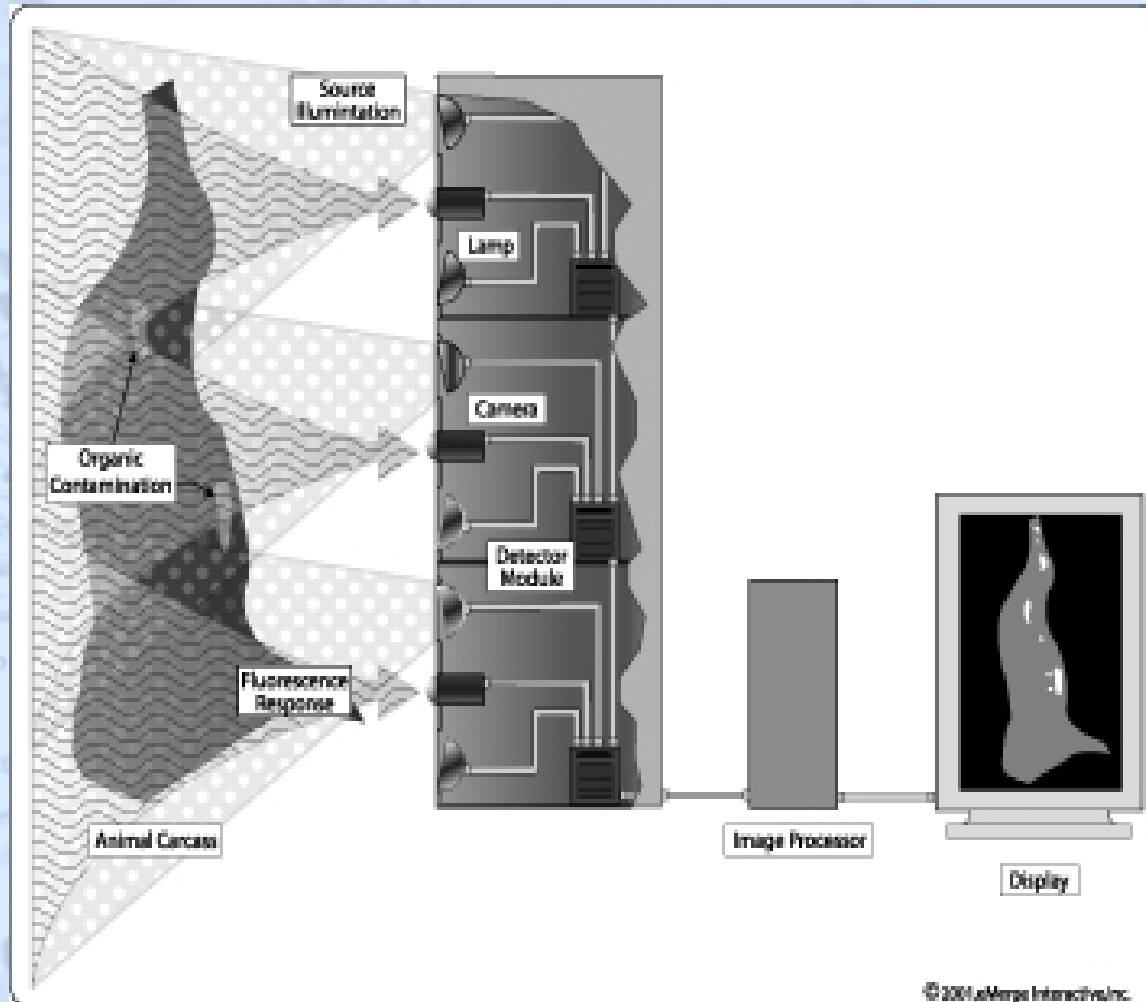
Total Coliforms, Fecal Coliforms, and *E. coli* used as indicators for food and water.

NEW INDICATORS FOR NEW TIMES

- **Better indicators**
- **Real-time results**
- **Easy to use**
- **Economical**
- **In-line systems**



NEW INDICATORS FOR NEW TIMES



© 2004 eMerge Interactive, Inc.

FUTURE OF PATHOGEN TESTING

- PCR Advancements
- DNA & RNA Chip Technologies
- Handheld DNA Probes
- Biosensors
- In-Line Detection Systems
- New Bioterrorism Pathogen Detectors



AND ONE FINAL COMMENT ABOUT MICROBIAL TESTING....

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



A faded, light blue map of South America serves as the background for the slide. The map shows the outlines of countries and some major cities. Labels for 'MEXIQUE' and 'AFRIQUE' are visible on the left side, and 'VENEZUELA' and 'GUYANE' are visible on the right side. The map is centered on the continent of South America.

TREND #4: WATER

**To prepare for the future of food safety,
consider the role of water in food
production.**

FORECASTS FOR THE 21ST CENTURY

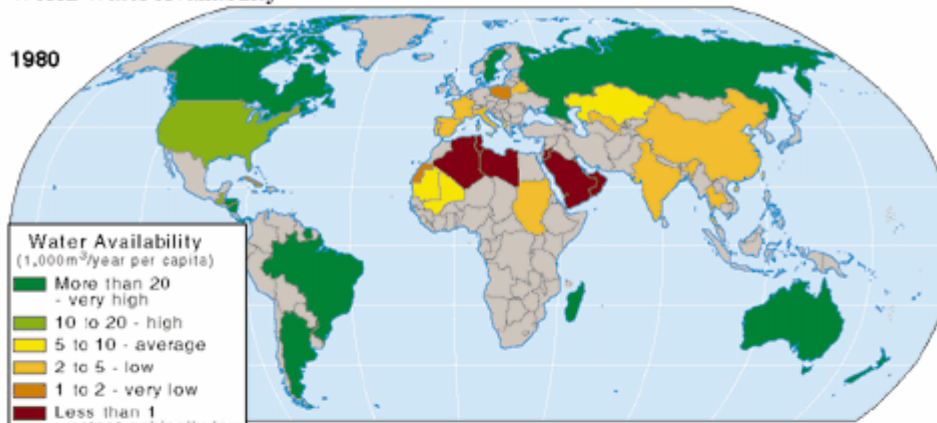
“Water supply will face enormous challenges over the coming decade.” (WHO 2000 Report)

“In contrast to food and energy, water scarcities will post significant challenges to governments... regional tensions will be heightened by 2015.” (Global Trends 2015 C.I.A.)

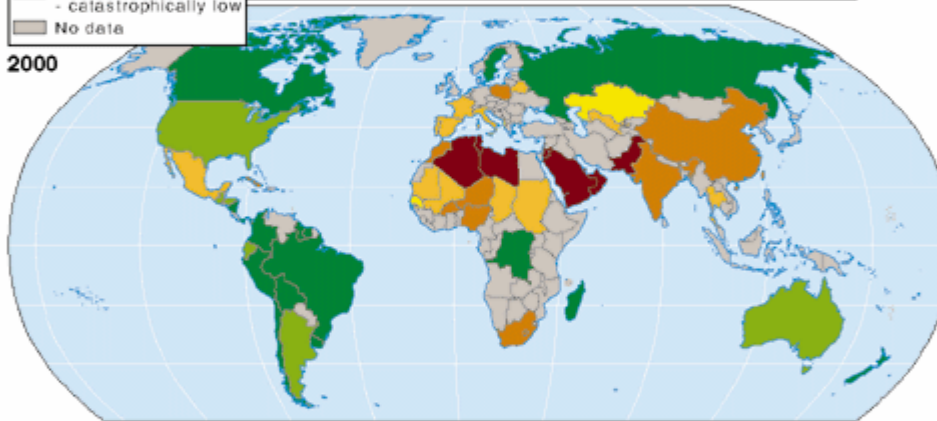
“The wars of the 21st Century will be over water.” (World Bank Vice President, 1995)

World Water Availability

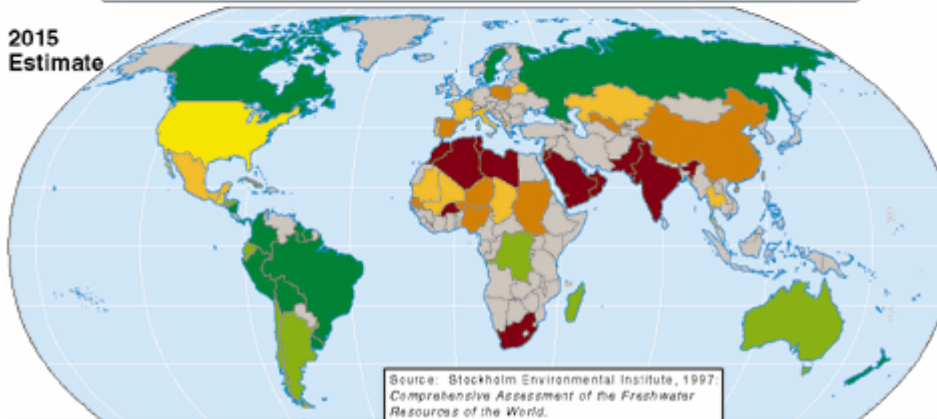
1980



2000



2015
Estimate



Source: Stockholm Environmental Institute, 1997.
Comprehensive Assessment of the Freshwater Resources of the World.

DI Cartography Center 754033A1 12-01

? Percent

Foodborne Disease = Waterborne

3 MAJOR SOURCES OF FOOD SUPPLY “WATER - LINK”

- **Agriculture**
- **Animal Husbandry**
- **Fisheries**



WATER FORECASTS FOR A FOOD PROCESSOR

- **Water usage will become more restricted**
- **Water will cost more**
- **Source waters will become more polluted**
- **Environmental regulations will get tougher**
- **Re-claim or re-use will become more popular**

A faded, light blue map of Central and South America serves as the background. It shows country borders and names such as Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Ecuador, Peru, and Guyana. Major cities like Mexico City, Bogotá, Lima, and Quito are also visible.

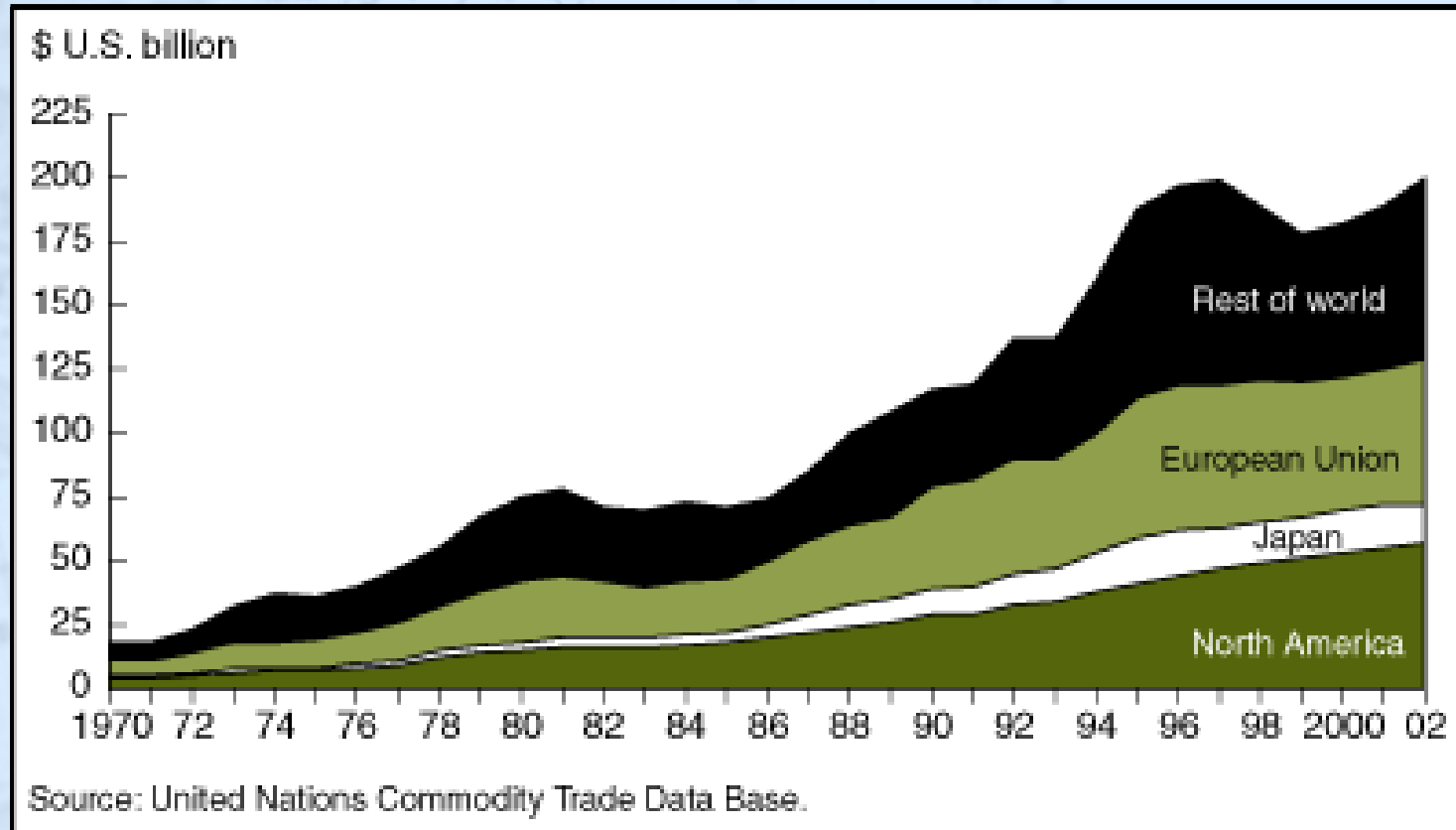
TREND #5: GLOBALIZATION & CULTURAL DIVERSITY

**To prepare for the future of food safety,
think and act - both globally and locally.**

GLOBALIZATION AND CULTURAL DIVERSITY TRENDS

- **Imported Foods and Ingredients**

WORLD TRADE IN PROCESSED FOOD



INTERNATIONAL DESSERT- CITRICO'S TIRAMISU

Cocoa Powder-
Switzerland

Roasted Espresso Beans-
Columbia

Mascarpone Cheese and Ladyfingers-
Italy

Vanilla Beans-
Madagascar



Chocolate-
Belgium

Kahlua-
Mexico

Mint Leaf –
United States

Cream-
United States

Created by Pastry Chef Erich Herbitschek

SELECT EXAMPLES OF INTERNATIONAL OUTBREAKS

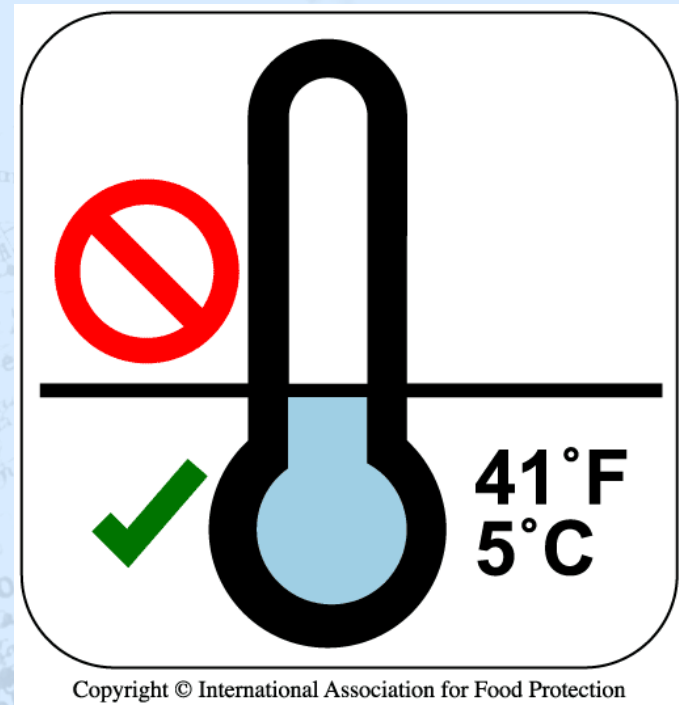
Canada	2000	S. Enteritidis	Almonds, USA	
Germany, Sweden, Denmark, Netherlands Austria, Belgium, Finland,	2001	S Oranienburg	Chocolate, Germany	Germany, Denmark, Sweden, Belgium, Austria Finland, Canada, Croatia
Europe & Australia	2001	S. Typhimurium 104	Helva, Turkey	23 Australia Europe
UK, Canada & Australia	2001	S. Stanley S. Newport S. Lexington	Dried peanuts, China	97 S. Stanley 11 S. Newport
NZ, UK, Canada & Australia	2002-3	S. Montevideo S. Tennessee & Others	Helva & tahini, Middle East	53
USA	2006-7	S. Tennessee	Peanut butter, USA	>560 USA, Global?

GLOBALIZATION AND CULTURAL DIVERSITY TRENDS

- **Imported Foods and Ingredients**
- **Global Competition**
- **International Standards**
- **Cultural Differences**
- **Diverse Consumers & Workforce**

FOOD PACKAGE LABELING EXAMPLE

Keep Refrigerated





**As globalization and cultural diversity
increases, we must create one
universal standard**

Serving Safe Food

Trend # 1 - Foodborne Disease Surveillance

Trend # 2 - Unexpected World Events

Trend # 3 - Microbial Testing

Trend # 4 - Water

Trend # 5 - Globalization & Cultural Diversity



“Unwrapping”

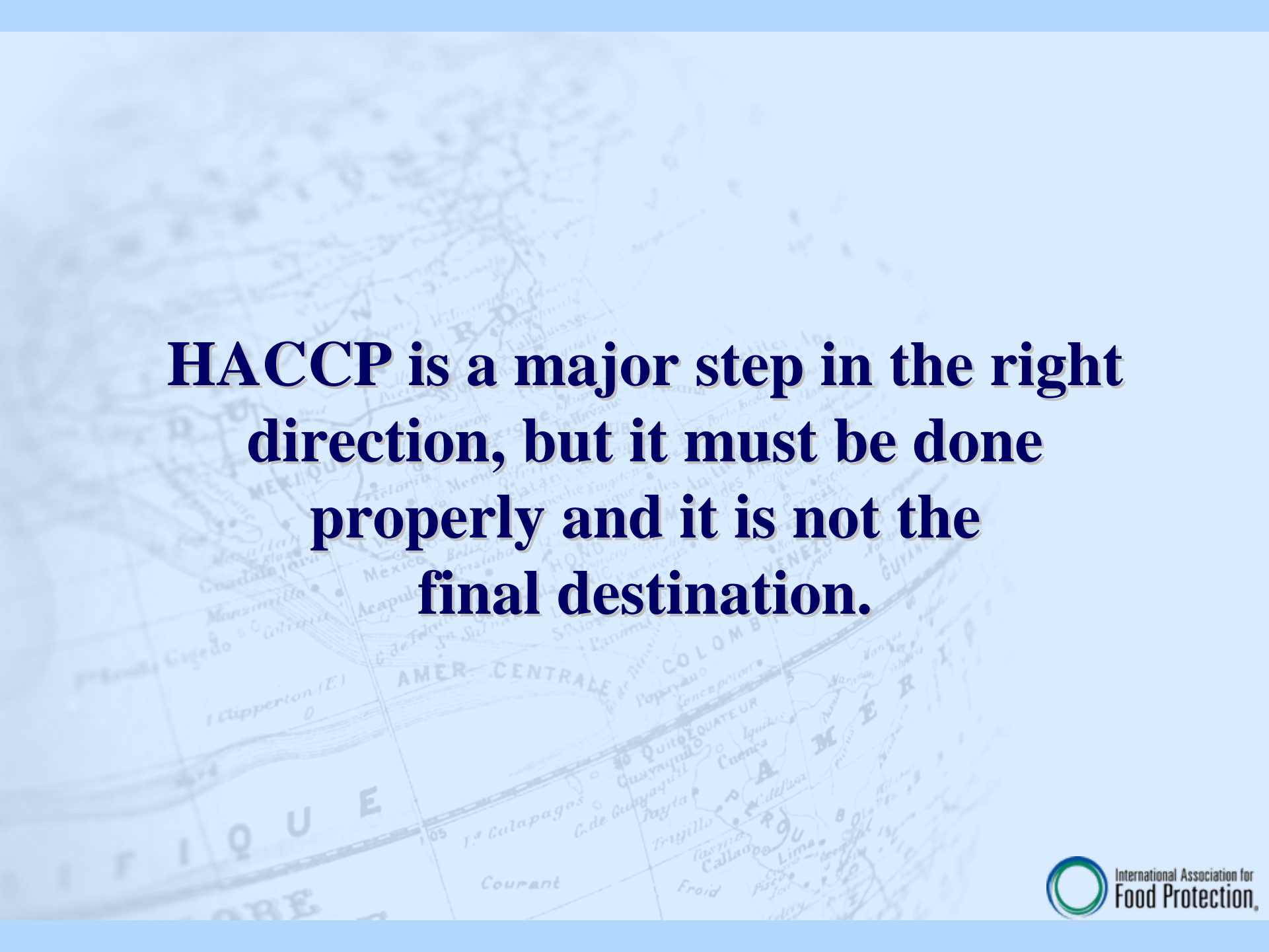
TRADITIONAL FOOD SAFETY STRATEGIES




- **Training**

- **Inspections**

- **Conventional Micro Testing**



HACCP is a major step in the right direction, but it must be done properly and it is not the final destination.



“We tend to meet any new situation by re-organizing, and a wonderful method it can be for creating the illusion of progress....”

- Petronium

Greek Philosopher, 210 B.C.

QUANTUM LEAPS VERSES INCREMENTAL PROGRESS

- **Break with tradition- “change-friendly”**
- **Creativity - a priority**
- **Learn from other disciplines**
- **Performance standards vs. prescriptive solutions**
- **Leaders and not just technicians**

ADVANCING FOOD SAFETY

Training



Inspections



Conventional Testing



HACCP

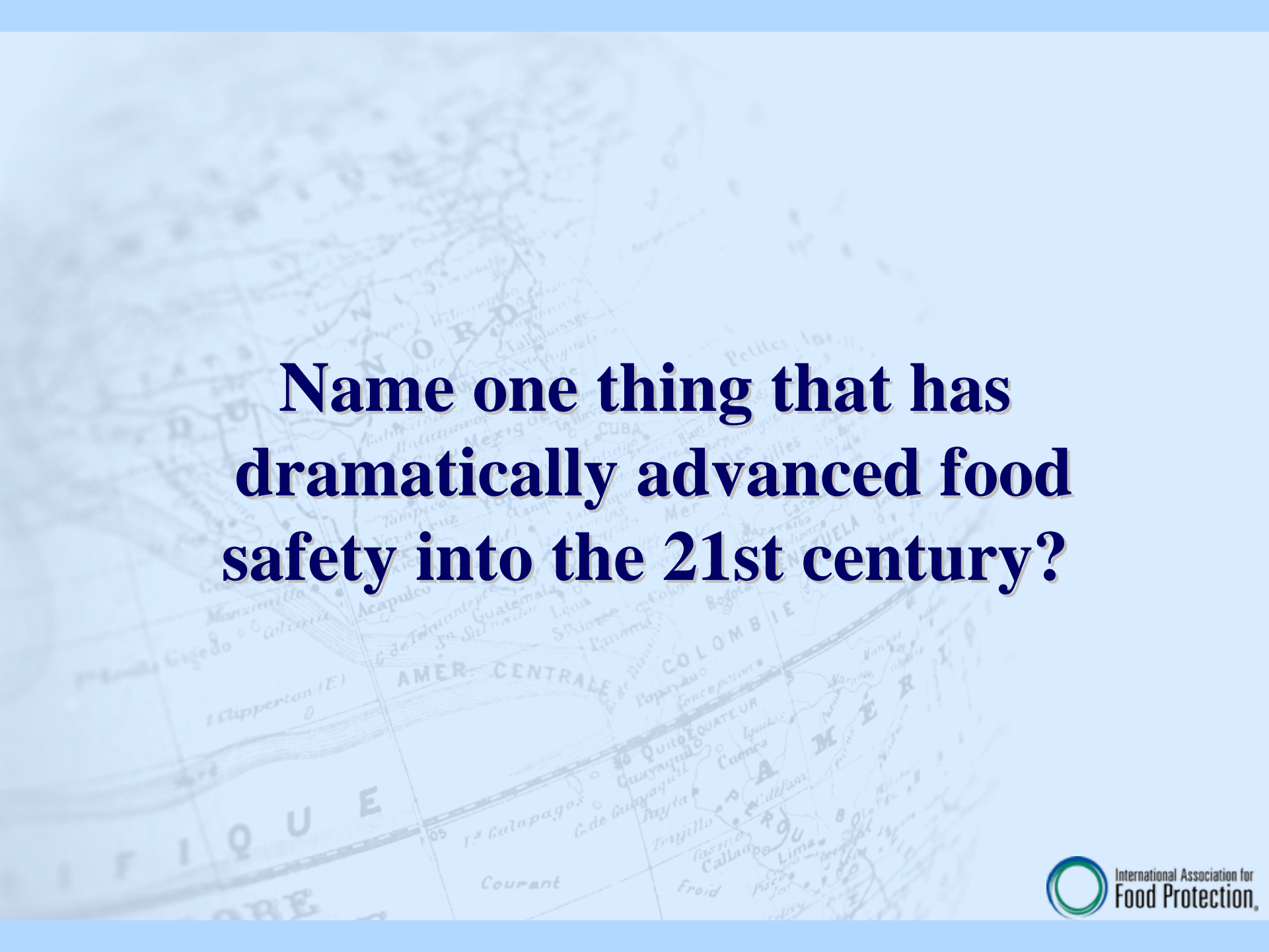


Technology



Surveillance





**Name one thing that has
dramatically advanced food
safety into the 21st century?**

PFGE + IT

The Power of a Non-Conventional Test

coupled with

The Information Highway

“Courage is the main quality of leadership, in my opinion, no matter where it is exercised. Usually it implies some risk-especially in new undertakings. Courage to initiate something and to keep it going-pioneering and adventurous spirit to blaze new ways, often, in our land of opportunity.”

WALT DISNEY