

Outbreaks Due to Unpasteurized Dairy Products in the United States

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention

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Pasteurization and Public Health

- Late 1800s — Developed by Louis Pasteur
 - ◆ Originally intended to prevent wine spoilage
- Early 1900s — Introduced to eliminate milkborne pathogens
- 1948 — First statewide requirement (Michigan)
- 1987 — FDA bans interstate sale of unpasteurized dairy products

Current State of Regulations

- Interstate sale prohibited by FDA
- Intrastate sale regulated by states
- 25 states permitted sale during 1993–2006
- Challenges to regulations
 - ◆ Attempts to circumvent rules
 - ◆ Attempts to seek legislative nullification

Policy Analysis

- Do restrictions on state raw milk sales reduce raw milk outbreaks?
- 87% of raw milk outbreaks during 1973–1992 in states that permitted intrastate sale
- CDC expanded analysis for 1993–2006

Policy Analysis Methods

- Outbreak summary data reported to CDC
 - ◆ Foodborne Outbreak Reporting System
 - ◆ All outbreaks that implicated milk or cheese
- Conducted descriptive analysis of outbreak data
- Surveyed states to determine legal status
- Calculated incidence of outbreaks in states
- Compared incidence by states' legal status

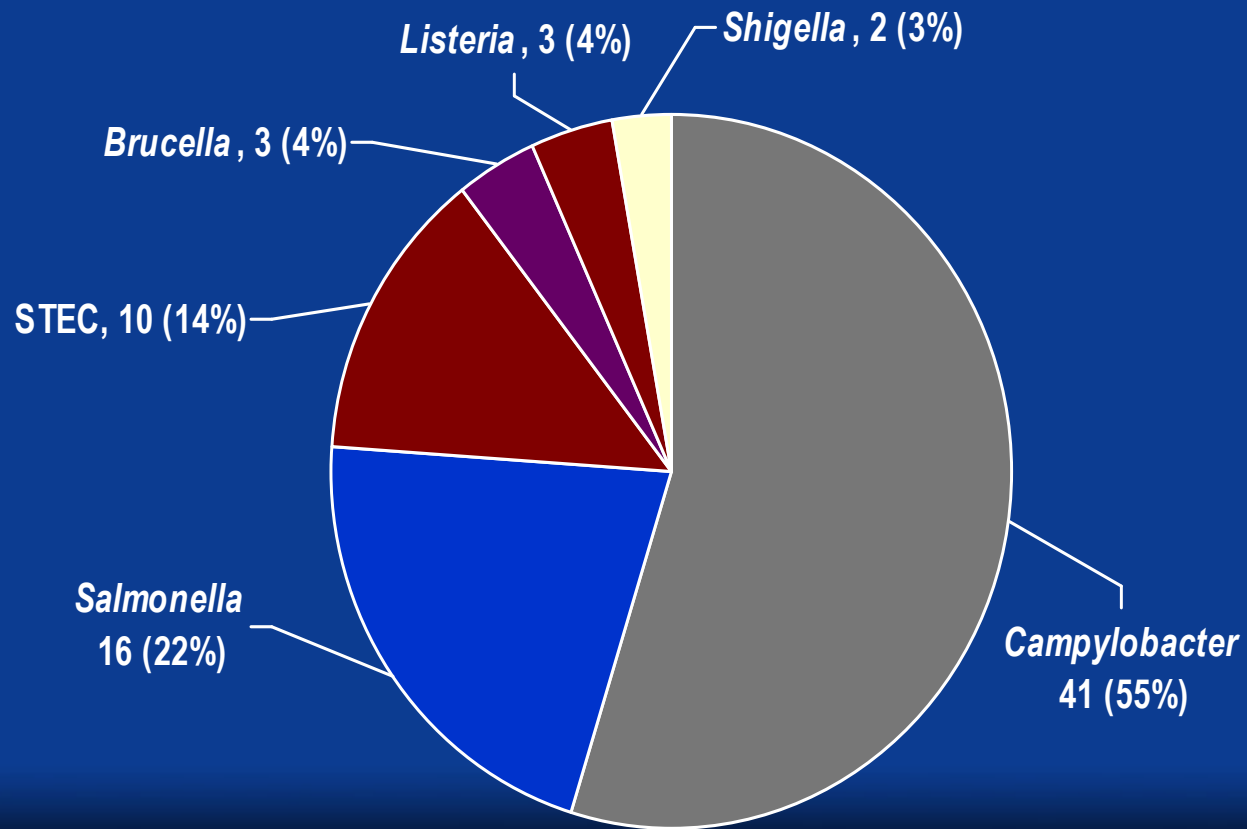
Outbreaks

123 Dairy Product Outbreaks
2,837 Cases
232 Hospitalizations
3 Deaths

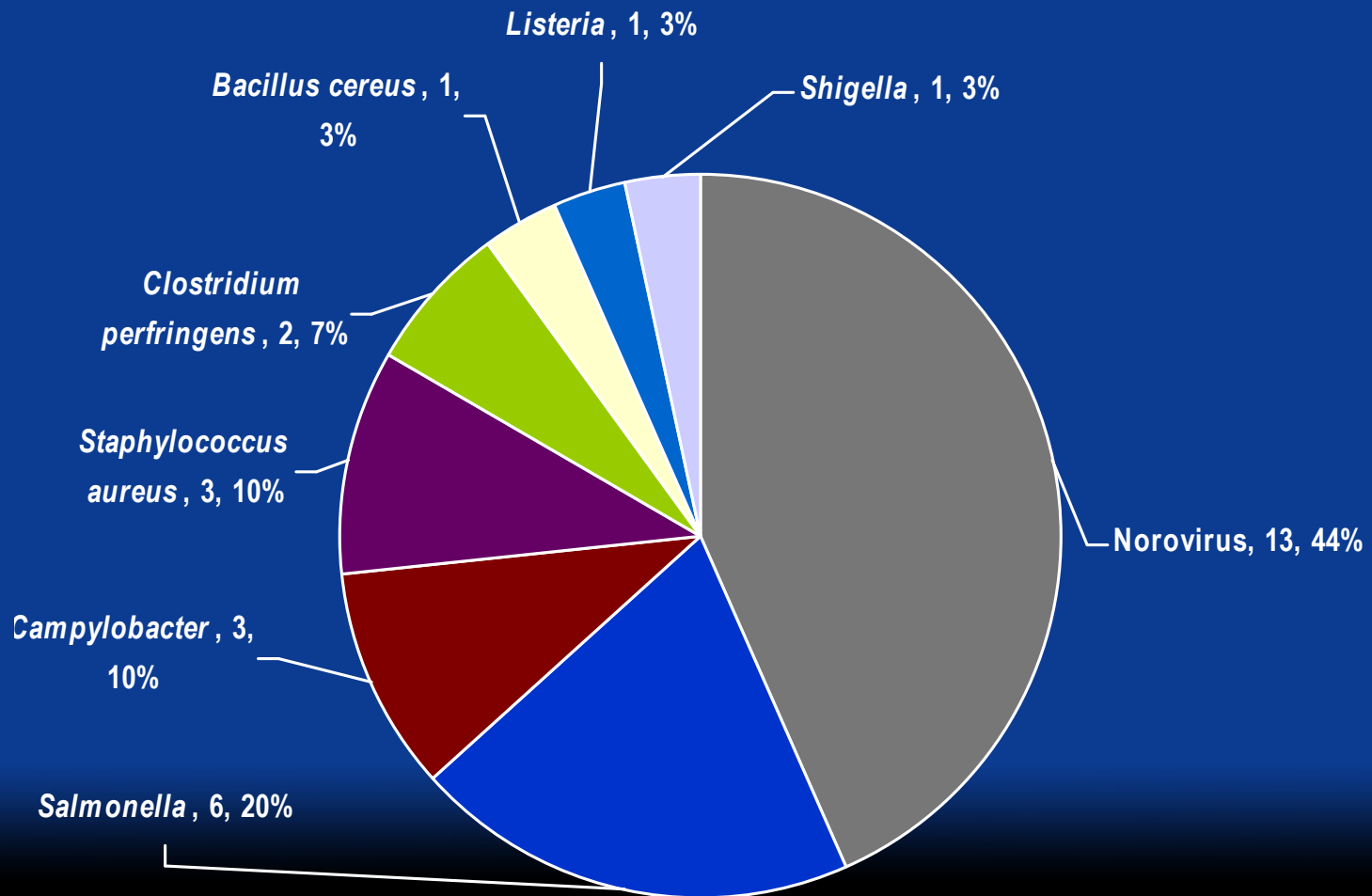
74 Unpasteurized
1,600 Cases
202 Hospitalizations
2 Deaths

48 Pasteurized
1,223 Cases
30 Hospitalizations
1 Death

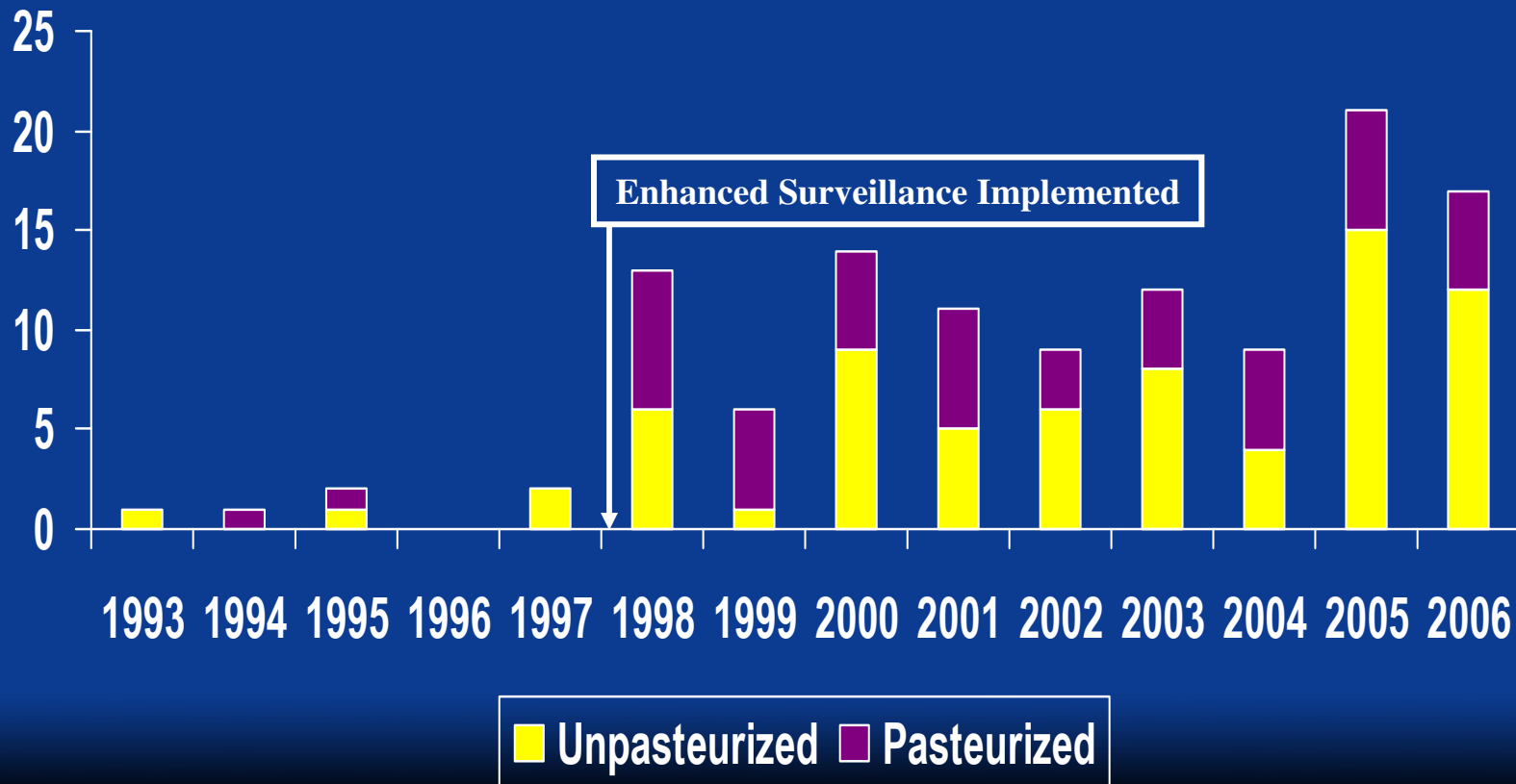
Etiologies — Unpasteurized



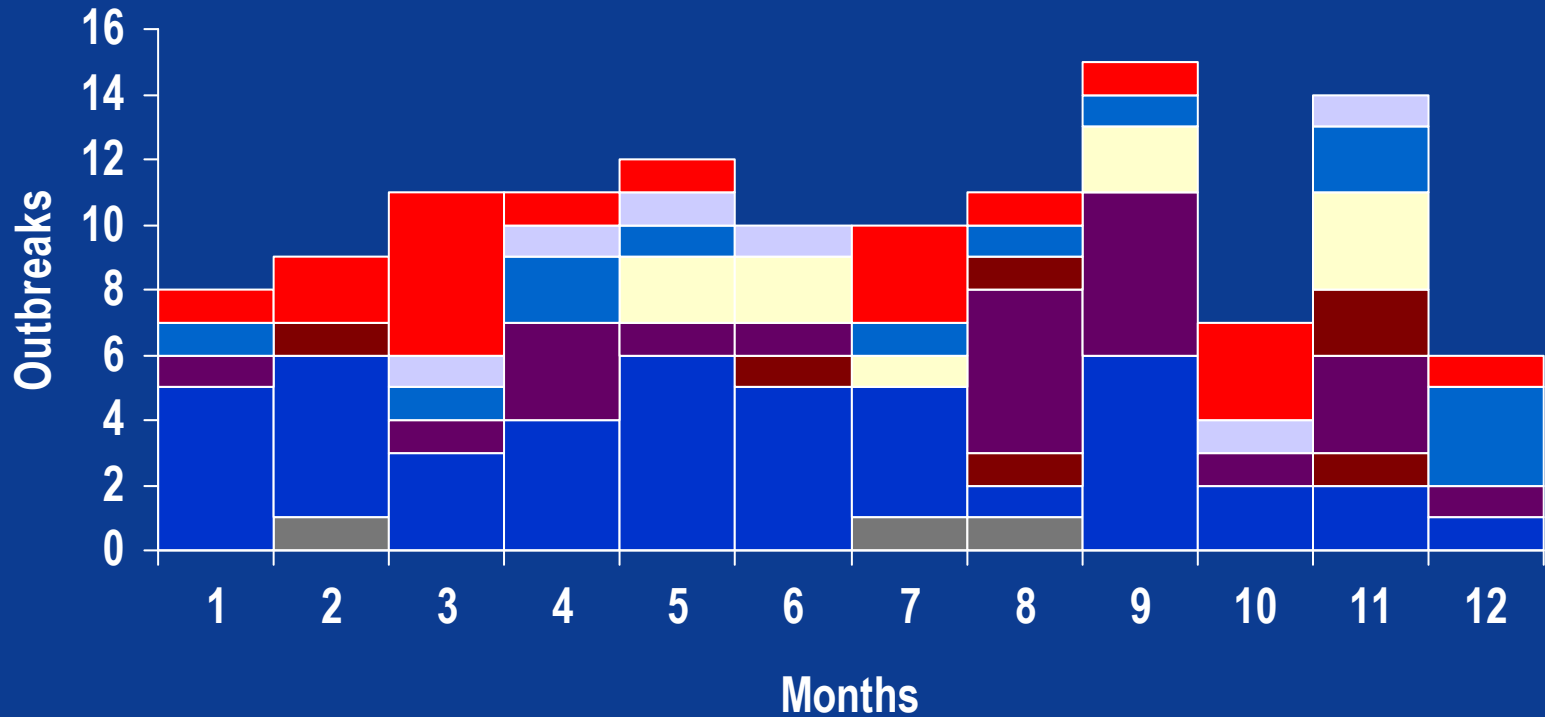
Etiologies — Pasteurized



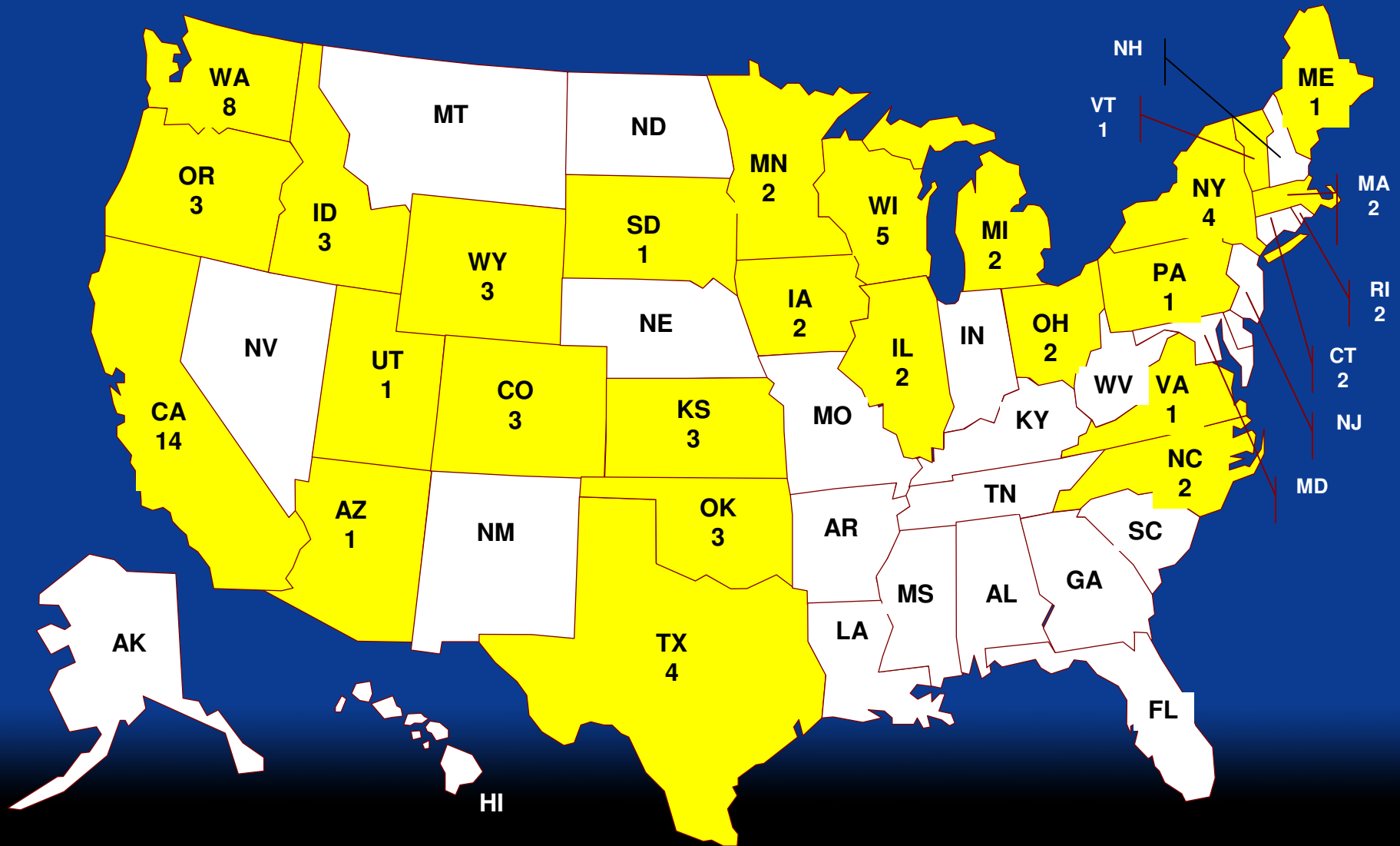
Reports by Year



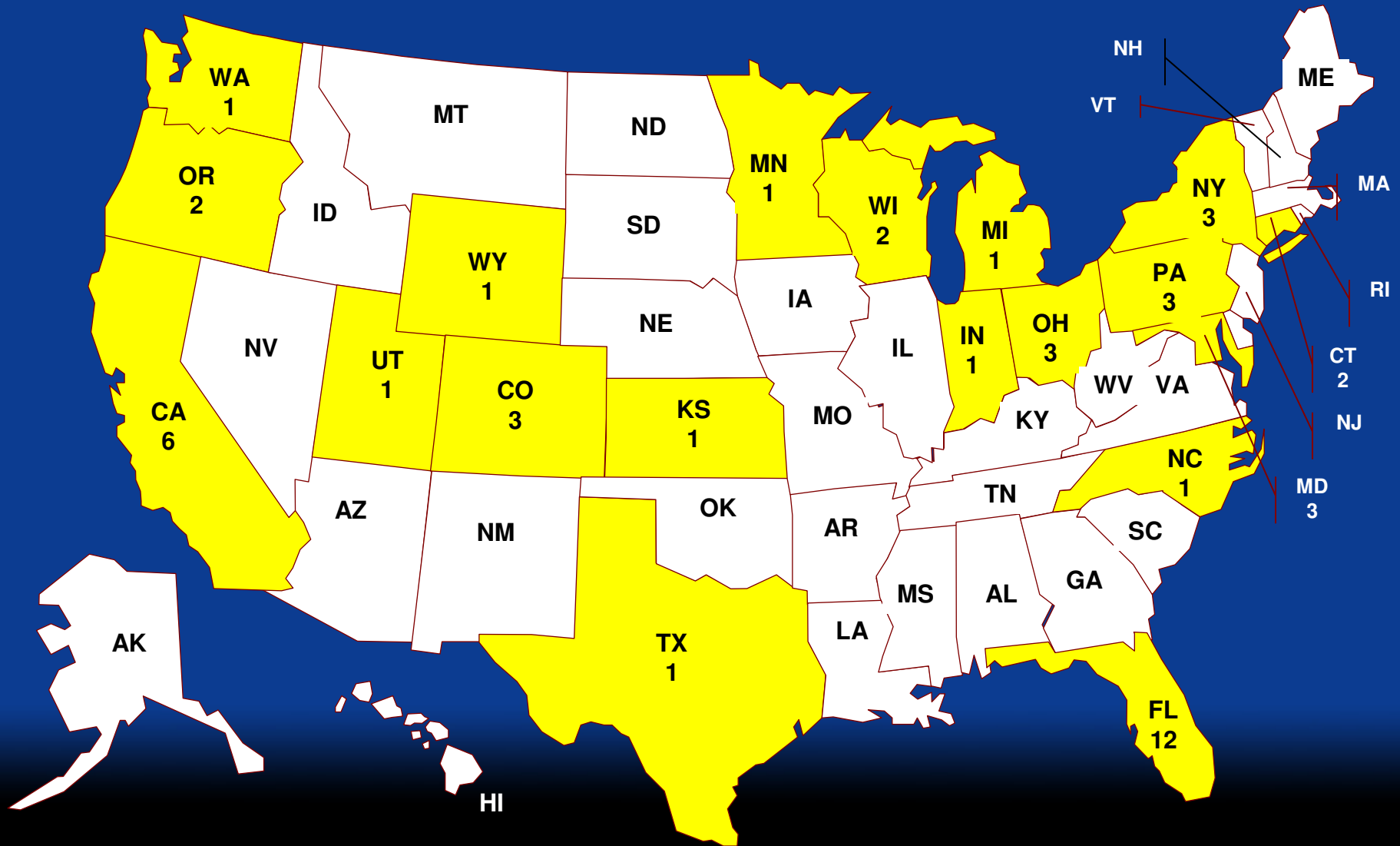
Seasonal Distribution



Unpasteurized product outbreaks, by state — 1993–2006 (N = 74)



Pasteurized product outbreaks, by state — 1993–2006 (N = 48)

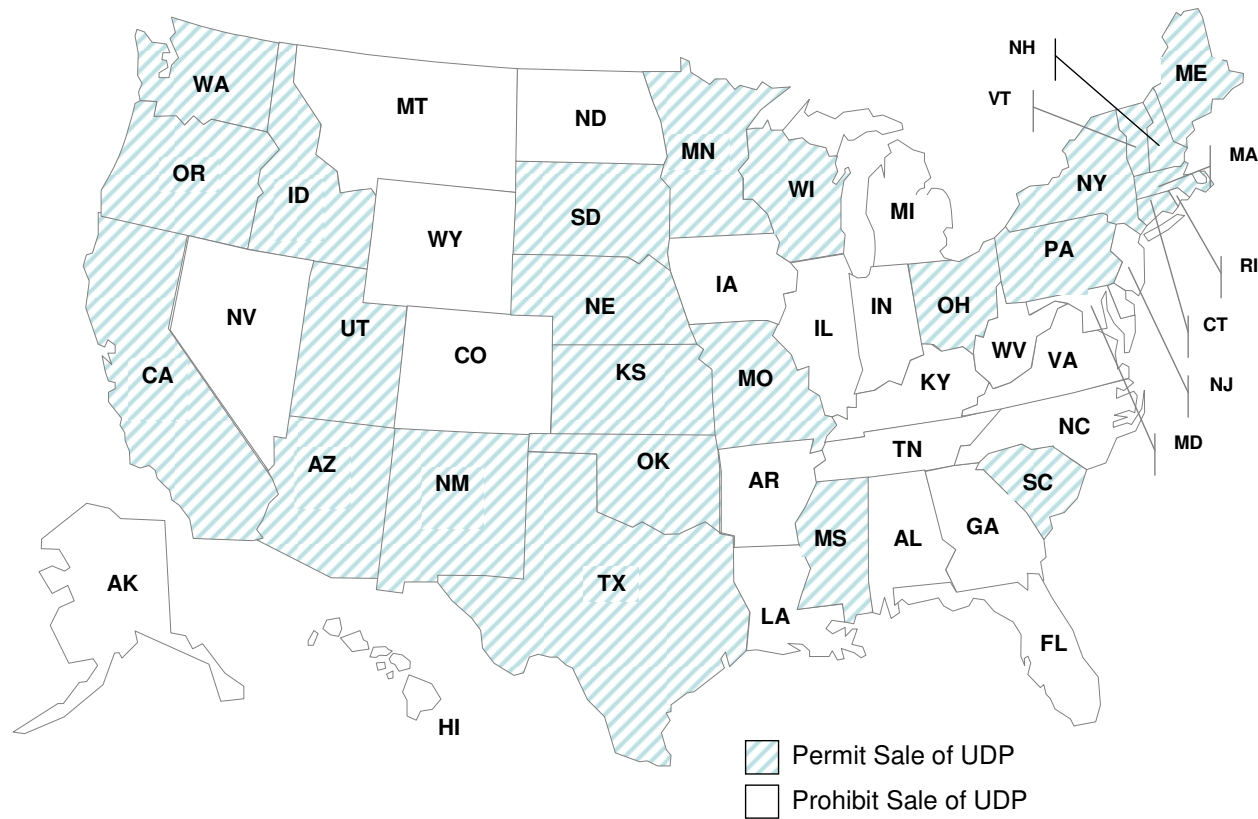


States' Legal Status

- Responses received from all 50 states
- Seven (14%) changed status during period
 - ◆ Three legalized sales
 - ◆ Three prohibited sales
 - ◆ One prohibited sales and then relegalized
- 21 (49%) of remaining states permitted sales

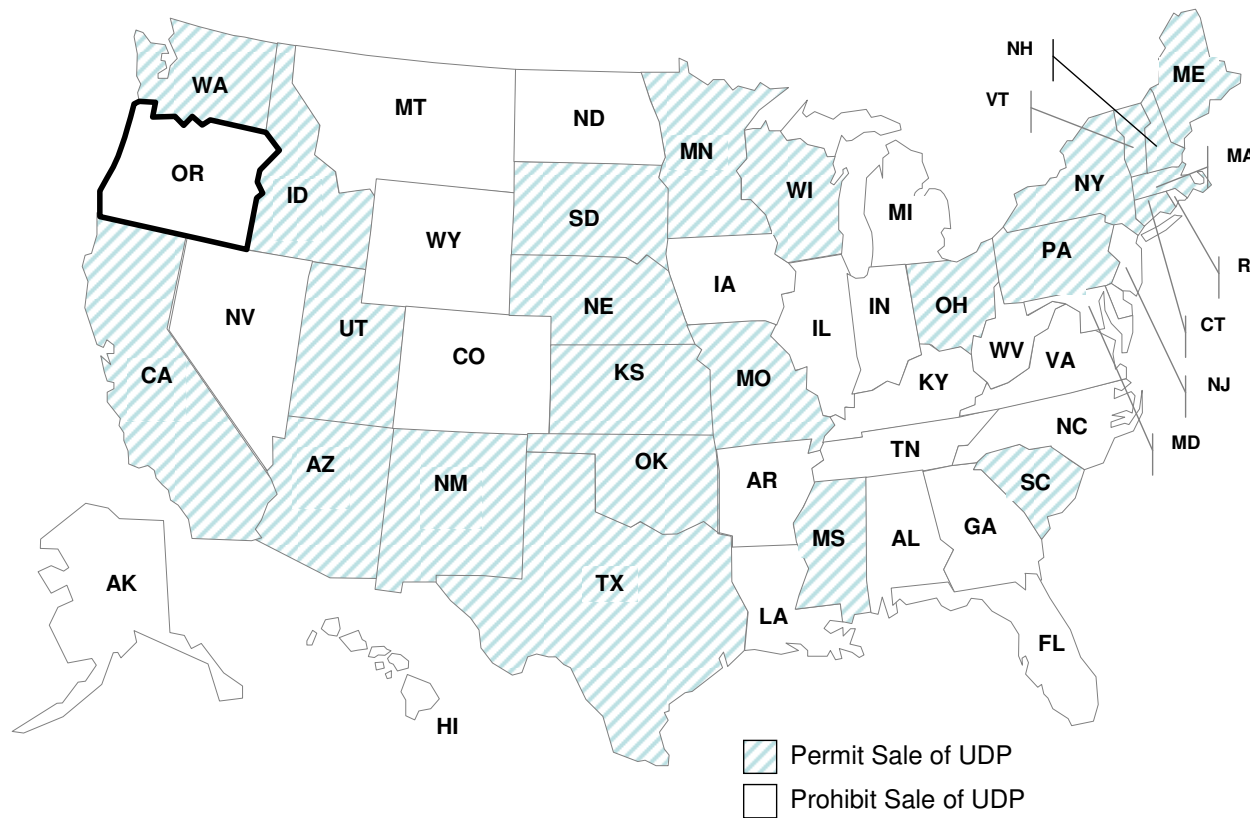
Legal Status — 1993

1993



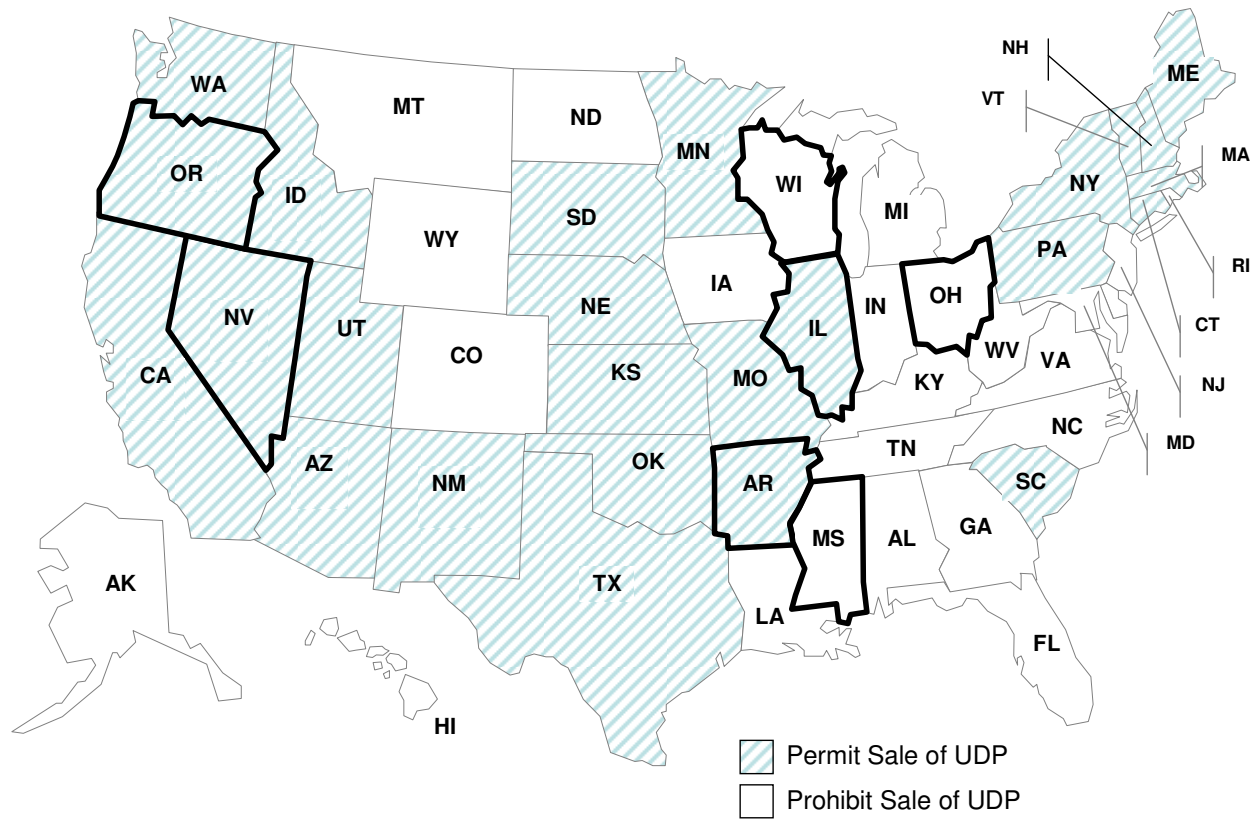
Legal Status — 1999

1999



Legal Status — 2006

2006



Unpasteurized Product Incidence (1993–2006)

Sum of Annual Population of U.S. during 1993–2006 =
3.9 Billion Person-Years

Sale Permitted
2.2 Billion Person-Years
56 Outbreaks
1045 Cases

Sale Prohibited
1.7 Billion Person-Years
15 Outbreaks
414 Cases

Unpasteurized Product Incidence (1993–2006)

Sale Permitted

$56 / 2.2B = 2.54^*$
 $1045 / 2.2B = 47.45^*$

Sale Prohibited

$15 / 1.7B = 0.88^*$
 $414 / 1.7B = 24.18^*$

Incidence Density Ratios

Outbreaks: $2.54 / 0.88 = 2.90$ (95% CI = 1.67–5.20)

Cases: $47.45 / 24.18 = 1.96$ (95% CI = 1.70–2.14)

* per 100 million person-years

Conclusions

- Unpasteurized product consumption continues to cause illness and outbreaks
- Outbreaks are associated with inadequate regulations restricting unpasteurized products
- Unpasteurized product outbreaks are more common and cause more severe illness than pasteurized product outbreaks

Limitations

- Outbreak surveillance data limited
 - ◆ Outbreaks likely underreported
 - ◆ Some outbreaks have limited information
- Data not adjusted for prevalence of unpasteurized product consumption

Recommendations

- Further restrict/prohibit distribution of unpasteurized dairy products
- Educate consumers about health risks of consuming unpasteurized products
 - ◆ Local, state, and federal public health partners
 - ◆ Clinicians
 - ◆ Consumer and advocacy groups



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Weekly

- **CDC. Campylobacter jejuni infection associated with unpasteurized milk and cheese--Kansas, 2007. MMWR Morb Mortal Wkly Rep 2009;57:1377-1379.**
- **CDC. Escherichia coli O157:H7 infections in children associated with raw milk and raw colostrum from cows—California, 2006. MMWR Morb Mortal Wkly Rep 2008;57:625-628.**
- **CDC. Outbreak of multidrug-resistant Salmonella enterica serotype Newport infections associated with consumption of unpasteurized Mexican-style aged cheese--Illinois, March 2006-April 2007. MMWR Morb Mortal Wkly Rep 2008;57:432-435.**
- **CDC. Salmonella Typhimurium Infection Associated with Raw Milk and Cheese Consumption --- Pennsylvania, 2007. MMWR Morb Mortal Wkly Rep 56;1161-1164.**
- **CDC. Escherichia coli O157:H7 Infection Associated with Drinking Raw Milk --- Washington and Oregon, November--December 2005. MMWR Morb Mortal Wkly Rep 56;165-167.**
- **CDC. Multistate Outbreak of Salmonella Serotype Typhimurium Infections Associated with Drinking Unpasteurized Milk --- Illinois, Indiana, Ohio, and Tennessee, 2002—2003. MMWR Morb Mortal Wkly Rep 52;613-615.**
- **CDC. Outbreak of Campylobacter jejuni Infections Associated with Drinking Unpasteurized Milk Procured through a Cow-Leasing Program --- Wisconsin, 2001. MMWR Morb Mortal Wkly Rep 51;548-549.**
- **CDC. Outbreak of Listeriosis Associated With Homemade Mexican-Style Cheese --- North Carolina, October 2000--January 2001. MMWR Morb Mortal Wkly Rep 50;560-2.**
- **CDC. Outbreak of Escherichia coli O157:H7 Infection Associated With Eating Fresh Cheese Curds --- Wisconsin, June 1998. MMWR Morb Mortal Wkly Rep 49;911-3.**
- **CDC. Campylobacteriosis Associated with Raw Milk Consumption – Pennsylvania. MMWR Morb Mortal Wkly Rep 32;337-8,344.**

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Questions?



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