

Foodborne Disease Outbreaks, Annual Summary, 1982

Kristine L. MacDonald, M.D.
Patricia M. Griffin, M.D.
Enteric Diseases Branch
Division of Bacterial Diseases
Center for Infectious Diseases

Introduction

Foodborne disease surveillance has traditionally served three objectives:

1. Disease Prevention and Control. Early identification and removal of contaminated products from the commercial market, correction of faulty food preparation practices in food service establishments and in the home, and identification and appropriate treatment of human carriers of foodborne pathogens are the main prevention and control measures that result from surveillance of foodborne disease.

2. Knowledge of Disease Causation. In over half of the foodborne disease outbreaks reported to CDC in each of the last 5 years, the responsible pathogen was not identified. In many of these outbreaks, pathogens known to cause foodborne illness may not have been identified because laboratory investigations were late or incomplete. In others, the responsible pathogen may have escaped detection even after thorough laboratory investigation, either because the pathogen may not have been recognized as a cause of foodborne disease or because the pathogen could not be identified by available laboratory techniques. When more thorough clinical, epidemiologic, and laboratory investigations are conducted, perhaps many of these pathogens can be identified, and suitable measures for prevention and control can be instituted.

3. Administrative Guidance. The collection of data from investigations of foodborne disease outbreaks permits the assessment of trends in the prevalence of etiologic agents and in vehicles of disease transmission. In addition, it brings to light common errors in food handling. Compiling and publishing annual data will enable local and state health departments and others involved in the implementation of food protection programs to be kept informed of the factors involved in foodborne disease outbreaks. Comprehensive surveillance should result in a greater awareness of the most important food protection methods, the institution of better training programs, and more effective use of available resources.

Methods

Definition of Outbreak. For the purpose of this report, a foodborne disease outbreak was defined as an incident in which 1) two or more persons experience a similar illness after ingestion of a common food, and 2) epidemiologic analysis implicates the food as the source of the illness. A few exceptions exist; for example, one case of botulism or chemical poisoning constitutes an outbreak.

Outbreaks of known etiology are those for which laboratory evidence of a specific agent is obtained and specified criteria are met. Outbreaks of unknown etiology are those for which epidemiologic evidence implicates a food source, but adequate laboratory confirmation is not obtained.

Source of Data. Outbreaks are reported to CDC on a standard reporting form. Reports come most frequently from state and local health departments; they may also be received

from Federal agencies such as the Food and Drug Administration (FDA), the U.S. Department of Agriculture (USDA), the U.S. Armed Forces, and occasionally from private physicians. Forms are reviewed at CDC to determine whether a specific etiologic agent for the outbreak can be confirmed and, in some instances, questions about an etiologic agent may be referred back to the reporting agency. Otherwise, data are accepted as reported.

Interpretation of Data. The limitations on the quantity and quality of data presented here must be recognized in order to avoid misinterpretation. The number of outbreaks of foodborne disease reported by this surveillance system clearly represents only a small fraction of the total number that occur. The likelihood of an outbreak's coming to the attention of health authorities is dependent on consumers' and physicians' awareness, their interest, and their motivation to report the incident. For example, large outbreaks; interstate outbreaks; restaurant-associated outbreaks; and outbreaks involving serious illnesses, hospitalizations, or deaths are more likely to come to the attention of health authorities than cases of mild illness following a family cookout.

The quality of the data presented here depends upon the commitment to surveillance of this type of disease by state or local health departments. A department's interest in foodborne disease, its investigative capabilities, and its laboratory facilities are important determinants of the quality of the investigation. Furthermore, the likelihood that the findings of the investigation will be reported varies from one locality to another. This report, then, should not be the basis of firm conclusions about the absolute incidence of foodborne disease, and it should not be used to draw conclusions about the relative incidence of foodborne diseases by specific causes. For example, foodborne diseases characterized by short incubation periods, such as those caused by a chemical agent or staphylococcal enterotoxin, are more likely to be recognized in common-source foodborne disease outbreaks than those diseases with longer incubation periods, such as hepatitis A. Outbreaks involving less common pathogens, such as *Bacillus cereus*, *Escherichia coli*, or *Giardia lamblia* are less likely to be confirmed because these organisms are often not considered in clinical, epidemiologic, and laboratory investigations of foodborne disease outbreaks. Also, since laboratory methods for confirming viral disease are not widely available, many outbreaks of foodborne illness due to viruses probably fall into the "unknown etiologic agent" category. Pathogens that generally cause mild illness will be underrepresented, while those causing serious illness, such as *Clostridium botulinum*, are more likely to be identified. Similarly, restaurant- or commercial-product-associated outbreaks have a higher likelihood of being reported.

Results

In 1982, 656 outbreaks (19,380 cases) of foodborne disease were reported to CDC. Reports were received from 39 states as well as from the District of Columbia, the U.S. Virgin Islands, Guam, and Puerto Rico (Figure 1). New York reported the largest number of outbreaks (323), with 160 from New York City; Washington reported the next largest number of outbreaks (44), followed by California (35).

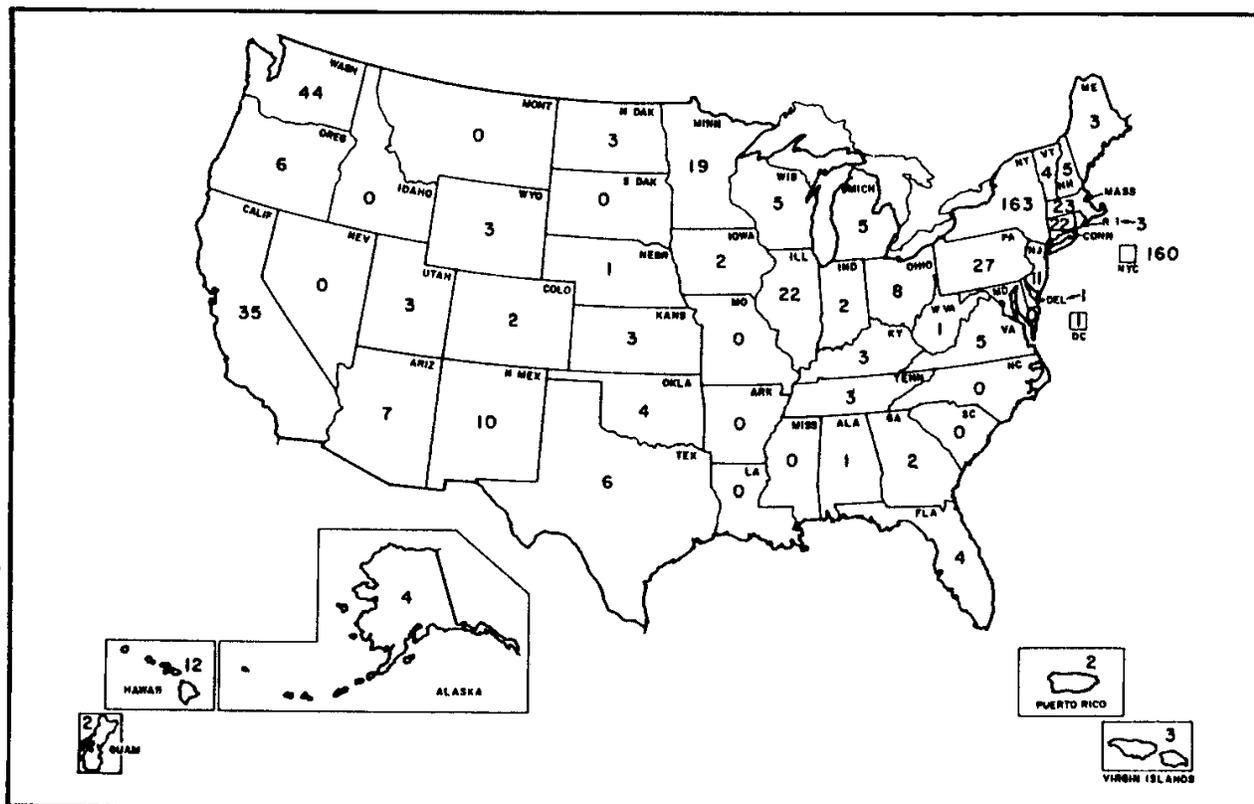
The etiologic agent was confirmed in 34% of the outbreaks (11,050 cases) (Table 1). Bacterial pathogens accounted for 151 outbreaks (5,501 cases). The most frequently isolated bacterial pathogen was *Salmonella* (55 outbreaks, 2,056 cases), followed by *Staphylococcus aureus* (28 outbreaks, 669 cases) and *Clostridium perfringens* (22 outbreaks, 1,189 cases). During 1982, two outbreaks (one in Oregon and one in Michigan) of a previously unrecognized pathogen, *E. coli* O157:H7, were investigated. Both outbreaks were associated with eating hamburger from the same fast-food restaurant chain. The illness was characterized by

bloody diarrhea, abdominal cramps, and low-grade or absent fever. Since it was first described, this pathogen has also been associated with non-bloody diarrhea and a spectrum of clinical illnesses, including hemolytic-uremic syndrome. Viral agents (hepatitis A and Norwalk virus) accounted for 21 outbreaks (5,325 cases). The high number of cases resulting from viral agents is predominantly due to two large outbreaks of Norwalk gastroenteritis that occurred in Minnesota. One outbreak involved 3,000 cases and was related to eating bakery items with frosting. The second involved 2,000 cases and was associated with eating cole slaw. Chemical agents were responsible for 47 outbreaks (220 cases). Only one outbreak, involving four persons with *Trichinella spiralis*, was attributed to a parasitic agent. Twenty-six deaths were associated with foodborne diseases in 1982: 11 from *Vibrio cholerae* O1 (all in Guam and the Trust Territories), eight from *Salmonella*, five from *C. botulinum*, and two from unknown causes. No pathogen was identified in 436 of the outbreaks (8,330 cases) reported in 1982.

Incubation periods were known for illnesses in 412 of the outbreaks. In 13 outbreaks, the incubation period was less than 1 hour; in 123 outbreaks, it was 1-7 hours; in 91 outbreaks, it was 8-14 hours; and in 185 outbreaks, it was 15 hours or more.

The food vehicle of transmission was determined in 168 (76%) of the 220 outbreaks in which a pathogen was identified (Table 2). For diseases caused by bacterial pathogens, meat or dairy products were the vehicles of transmission in 52% of the outbreaks in which the vehicle was known. For diseases caused by chemicals, fish or shellfish were the vehicles of transmission in 57% of the outbreaks. Food eaten in a restaurant was associated with 44% of outbreaks, and food eaten at home, with 30% (Table 3). The proportion of foodborne illness due to known etiologic agents was higher in the summer months than at any other time of year (Table 4).

FIGURE 1. Outbreaks of foodborne disease reported to CDC, by state, 1982



Discussion

The inconsistency in reporting can be seen by looking at the distribution of outbreaks by state. A few states, such as New York and Washington, reported a disproportionately large number of outbreaks. For example, New York State and New York City reported 323 outbreaks, almost one-half of those reported for the entire United States. While it is possible that states such as New York and Washington have a higher rate of foodborne disease, it is more likely that these figures simply represent differences in surveillance activity. The same inconsistency can be seen when looking at outbreaks by pathogen. CDC data show that *C.botulinum* is as common a foodborne pathogen as *Campylobacter jejuni* and *Vibrio parahaemolyticus*, a finding that indicates only that botulism is reported more comprehensively than some other pathogens.

The number of outbreaks of foodborne disease of confirmed etiology that were reported to CDC over the last 5 years has remained relatively constant. The distribution of cases by etiologic agent has also remained fairly consistent. Etiologic agents typically have been confirmed in about 40% of all outbreaks. When etiologic agents have been confirmed, bacterial pathogens have consistently accounted for approximately two-thirds of the outbreaks, and chemical agents for an additional 20%-25%.

Many food preparation practices contribute to foodborne disease (Table 5). In 1982, the five most common practices, in order of frequency of occurrence, included 1) improper holding temperature, 2) food from an unsafe source, 3) inadequate cooking, 4) poor personal hygiene on the part of food handlers, and 5) contaminated equipment. In most of the outbreaks caused by bacterial pathogens, the food had been stored at improper holding temperatures. In outbreaks of botulism or trichinosis, the food had usually been inadequately cooked. In outbreaks of ciguatera and mushroom poisoning, the food itself was unsafe, and illness was not related to improper handling or preparation.

The large number of outbreaks in which no pathogen was identified points out the need for the improvement of investigative skills so that known pathogens can be identified more frequently, and new and as-yet-unidentified pathogens can be recognized.

TABLE 1. Confirmed foodborne disease outbreaks, cases, and deaths, by etiologic agents, United States, 1982

Etiologic agent	Outbreaks		Cases		Deaths	
	No.	(%)	No.	(%)	No.	(%)
BACTERIAL						
<i>Bacillus cereus</i>	8	(3.6)	200	(1.8)	0	(0.0)
<i>Brucella</i>	1	(0.5)	3	(< 0.1)	0	(0.0)
<i>Campylobacter jejuni</i>	2	(0.9)	31	(0.3)	0	(0.0)
<i>Clostridium botulinum</i>	21	(9.5)	30	(0.3)	5	(20.9)
<i>Clostridium perfringens</i>	22	(10.0)	1,189	(10.8)	0	(0.0)
<i>Escherichia coli</i>	2	(0.9)	47	(0.4)	0	(0.0)
<i>Salmonella</i>	55	(25.0)	2,056	(18.6)	8	(33.3)
<i>Shigella</i>	4	(1.8)	116	(1.1)	0	(0.0)
<i>Staphylococcus aureus</i>	28	(12.7)	669	(6.0)	0	(0.0)
<i>Streptococcus</i> Group A	1	(0.5)	34	(0.3)	0	(0.0)
<i>Vibrio cholerae</i> O1	1	(0.5)	892	(8.0)	11	(45.8)
<i>Vibrio cholerae</i> non-O1	1	(0.5)	7	(0.1)	0	(0.0)
<i>Vibrio parahaemolyticus</i>	3	(1.4)	39	(0.4)	0	(0.0)
<i>Yersinia enterocolitica</i>	2	(0.9)	188	(1.7)	0	(0.0)
Total	151	(68.7)	5,501	(49.9)	24	(100.0)
CHEMICAL						
Ciguatera	8	(3.6)	37	(0.3)	0	(0.0)
Heavy metals	5	(2.3)	26	(0.2)	0	(0.0)
Monosodium glutamate	3	(1.4)	10	(0.1)	0	(0.0)
Mushrooms	4	(1.8)	9	(0.1)	0	(0.0)
Scombrototoxin	18	(8.2)	58	(0.5)	0	(0.0)
Shellfish	1	(0.5)	5	(< 0.1)	0	(0.0)
Other	8	(3.6)	75	(0.7)	0	(0.0)
Total	47	(21.4)	220	(1.9)	0	(0.0)
PARASITIC						
<i>Trichinella spiralis</i>	1	(0.5)	4	(< 0.1)	0	(0.0)
Total	1	(0.5)	4	(< 0.1)	0	(0.0)
VIRAL						
Hepatitis A	19	(8.5)	325	(2.9)	0	(0.0)
Norwalk virus	2	(0.9)	5,000	(45.2)	0	(0.0)
Total	21	(9.4)	5,325	(48.1)	0	(0.0)
CONFIRMED TOTAL	220	(100.0)	11,050	(100.0)	24	(100.0)

TABLE 2. Foodborne outbreaks by specific etiologic

Etiologic agent	Beef	Ham	Pork	Sau- sage	Chick- en	Tur- key	Other meat	Shell- fish	Tuna	Mahi- Mahi	Other fish	Milk	Eggs	Ice cream
BACTERIAL														
<i>B. cereus</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Brucella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>C. jejuni</i>	-	-	-	-	-	-	-	-	-	-	-	2	-	-
<i>C. botulinum</i>	1	-	-	-	-	-	-	-	-	-	1	-	-	-
<i>C. perfringens</i>	6	-	-	-	-	4	2	-	-	-	-	-	-	-
<i>E. coli</i>	2	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Salmonella</i>	1	-	2	1	2	4	1	-	-	-	1	1	2	4
<i>Shigella</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>S. aureus</i>	5	3	2	1	4	3	1	-	-	-	-	-	-	-
<i>Streptococcus</i> Group A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>V. cholerae</i> O1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>V. cholerae</i> non-O1	-	-	-	-	-	-	-	1	-	-	-	-	-	-
<i>V. parahaemolyticus</i>	-	-	-	-	-	-	-	3	-	-	-	-	-	-
<i>Y. enterocolitica</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	16	3	4	2	6	11	4	4	1	-	2	4	2	5
CHEMICAL														
Ciguatoxin	-	-	-	-	-	-	-	-	-	-	8	-	-	-
Heavy metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monosodium glutamate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mushrooms	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shellfish	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Scombrototoxin	-	-	-	-	-	-	-	-	3	5	10	-	-	-
Other	1	-	-	1	-	-	-	-	-	-	-	-	-	-
Total	1	-	-	1	-	-	-	1	3	5	18	-	-	-
PARASITIC														
<i>Trichinella spiralis</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	1	-	-	-	-	-	-	-	-	-	-	-
VIRAL														
Hepatitis A	-	-	-	-	-	-	-	5	1	-	-	-	-	1
Norwalk virus	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	5	1	-	-	-	-	1
CONFIRMED TOTAL	17	3	5	3	6	11	4	10	5	5	20	4	2	6
UNKNOWN	5	2	1	1	7	-	-	56	2	-	1	-	1	-
TOTAL 1982	22	5	6	4	13	11	4	66	7	5	21	4	3	6

agent and vehicle of transmission, United States, 1982

Baked foods	Fruits & vegetable	Potato salad	Poultry, fish, egg salad	Other salad	Fried rice	Chinese food	Mexican food	Carbonated bev	Non-dairy bev	Multiple foods	Mushrooms	Other foods	Unknown	Total
1	-	-	-	1	3	-	-	-	-	-	-	1	-	8
-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
-	16	-	-	-	-	-	-	-	-	-	1	1	1	21
-	-	-	-	-	-	-	2	-	-	1	-	-	7	22
-	-	-	1	2	-	-	1	-	-	-	-	-	-	2
-	-	-	-	1	-	-	-	-	-	-	-	3	29	55
2	-	2	1	-	-	-	1	-	-	1	-	-	2	4
-	-	-	-	1	-	-	-	-	-	-	-	-	2	28
-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
-	1	-	-	-	-	-	-	-	-	-	-	-	-	3
-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	17	2	2	5	3	-	4	-	-	3	1	5	42	151
-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
-	-	-	-	-	-	-	-	4	1	-	-	-	-	5
-	-	-	-	-	-	2	-	-	-	1	-	-	-	3
-	-	-	-	-	-	-	-	-	-	-	4	-	-	4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
-	1	-	-	-	-	-	-	1	1	-	-	3	-	8
-	1	-	-	-	-	2	-	5	2	1	4	3	-	47
-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
1	-	-	-	-	-	-	-	-	-	1	-	-	10	19
1	-	-	-	1	-	-	-	-	-	-	-	-	-	2
2	-	-	-	1	-	-	-	-	-	1	-	-	10	21
5	18	2	2	6	3	2	4	5	2	5	5	8	52	220
5	1	3	1	6	1	1	2	-	-	5	1	9	325	436
10	19	5	3	12	4	3	6	5	2	10	6	17	377	656

TABLE 3. Foodborne disease outbreaks, by specific etiologic agent and place where food was eaten, United States, 1982

Etiologic agent	Delicatessen, cafeteria, or							Total	
	Home	restaurant	School	Picnic	Church	Camp	Other Unknown		
BACTERIAL									
<i>B. cereus</i>	-	3	2	-	-	1	2	-	8
<i>Brucella</i>	1	-	-	-	-	-	-	-	1
<i>C. jejuni</i>	1	-	-	-	-	-	1	-	2
<i>C. botulinum</i>	21	-	-	-	-	-	-	-	21
<i>C. perfringens</i>	-	9	1	-	-	-	12	-	22
<i>E. coli</i>	-	-	-	-	-	-	2	-	2
<i>Salmonella</i>	12	17	6	3	4	1	12	-	55
<i>Shigella</i>	1	2	-	-	1	-	-	-	4
<i>S. aureus</i>	4	7	2	2	2	1	10	-	28
<i>Streptococcus</i> Group A	-	-	-	-	-	-	1	-	1
<i>V. cholerae</i> O1	1	-	-	-	-	-	-	-	1
<i>V. cholerae</i> non-O1	1	-	-	-	-	-	-	-	1
<i>V. parahaemolyticus</i>	1	-	-	1	-	-	1	-	3
<i>Y. enterocolitica</i>	1	-	-	-	-	-	1	-	2
Total	44	38	11	6	7	3	42	-	151
CHEMICAL									
Ciguatoxin	3	5	-	-	-	-	-	-	8
Heavy metals	1	3	-	-	-	-	1	-	5
Monosodium glutamate	1	2	-	-	-	-	-	-	3
Mushroom	3	-	-	-	-	-	1	-	4
Shellfish	1	-	-	-	-	-	-	-	1
Scombrototoxin	7	9	-	-	-	-	2	-	18
Other chemical	4	4	-	-	-	-	-	-	8
Total	20	23	-	-	-	-	4	-	47
PARASITIC									
<i>Trichinella spiralis</i>	1	-	-	-	-	-	-	-	1
Total	1	-	-	-	-	-	-	-	1
VIRAL									
Hepatitis A	5	6	-	1	-	1	6	-	19
Norwalk virus	-	1	-	-	-	-	1	-	2
Total	5	7	-	1	-	1	7	-	21
CONFIRMED TOTAL	70	68	11	7	7	4	53	-	220
UNKNOWN	127	221	17	16	2	1	49	3	436
TOTAL 1982	197	289	28	23	9	5	102	3	656

TABLE 4. Foodborne disease outbreaks by specific etiologic agent and month of occurrence, United States, 1982

Etiologic agent	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown	Total
BACTERIAL														
<i>Brucella</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	1
<i>B. cereus</i>	2	-	-	-	-	-	2	2	2	-	-	-	-	8
<i>C. jejuni</i>	-	-	-	-	-	1	-	-	1	-	-	-	-	2
<i>C. botulinum</i>	-	3	-	-	2	3	3	2	1	1	3	3	-	21
<i>C. perfringens</i>	-	2	1	1	5	2	1	2	2	1	2	3	-	22
<i>E. coli</i>	-	1	-	-	1	-	-	-	-	-	-	-	-	2
<i>Salmonella</i>	2	1	1	5	4	5	10	11	3	5	3	5	-	55
<i>Shigella</i>	-	-	-	1	-	-	-	-	1	1	1	-	-	4
<i>S. aureus</i>	2	1	1	2	2	3	5	5	1	3	1	2	-	28
<i>Streptococcus</i> Group A	-	-	-	-	-	-	1	-	-	-	-	-	-	1
<i>V. cholerae</i> O1	-	-	-	-	-	-	-	1	-	-	-	-	-	1
<i>V. cholerae</i> non-O1	-	-	-	-	-	-	-	-	-	-	-	1	-	1
<i>V. parahaemolyticus</i>	-	-	-	-	-	-	2	1	-	-	-	-	-	3
<i>Y enterocolitica</i>	-	1	-	-	-	1	-	-	-	-	-	-	-	2
Total	6	9	4	9	14	15	24	24	11	11	10	14	-	151
CHEMICAL														
Ciguatoxin	1	-	-	-	-	-	3	3	-	-	1	-	-	8
Heavy metals	1	1	-	-	1	-	-	-	-	-	2	-	-	5
Monosodium glutamate	1	-	1	-	-	-	-	1	-	-	-	-	-	3
Mushrooms	-	-	1	-	-	-	2	-	1	-	-	-	-	4
Shellfish	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Scombrototoxin	1	-	-	-	-	1	1	4	6	4	-	1	-	18
Other	-	-	2	2	1	-	-	-	1	1	1	-	-	8
Total	4	1	4	2	2	1	6	9	8	5	4	1	-	47
PARASITIC														
<i>Trichinella spiralis</i>	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Total	-	-	-	-	1	-	-	-	-	-	-	-	-	1
VIRAL														
Hepatitis A	3	-	-	-	2	3	3	4	1	1	-	2	-	19
Norwalk virus	-	-	-	-	-	-	-	1	-	-	1	-	-	2
Total	3	-	-	-	2	3	3	5	1	1	1	2	-	21
CONFIRMED TOTAL	13	10	8	11	19	19	33	38	20	17	15	17	-	220
UNKNOWN	27	31	27	29	43	31	21	32	30	27	26	112	-	436
TOTAL 1982	40	41	35	40	62	50	54	70	50	44	41	129	-	656

TABLE 5. Foodborne disease outbreaks by etiologic agent and contributing factors, United States, 1982

Etiologic agent	Number of reported outbreaks	Outbreaks in which factors reported	Improper holding temperatures	Inadequate cooking	Contaminated equipment	Food from unsafe source	Poor personal hygiene	Other
BACTERIAL								
<i>B. cereus</i>	8	5	5	-	-	-	1	-
<i>Brucella</i>	1	-	-	-	-	-	-	-
<i>C. jejuni</i>	2	2	-	-	-	1	-	1
<i>C. botulinum</i>	21	4	1	-	-	-	-	3
<i>C. perfringens</i>	22	20	19	8	3	-	-	2
<i>E. coli</i>	2	1	1	-	-	-	-	-
<i>Salmonella</i>	55	34	16	18	6	6	7	4
<i>Shigella</i>	4	4	1	-	-	-	4	-
<i>S. aureus</i>	28	21	20	3	4	1	9	1
<i>Streptococcus</i> Group A	1	1	1	-	-	-	1	-
<i>Streptococcus</i> Group D	1	-	-	-	-	-	-	-
<i>V. cholerae</i> O1	1	-	-	-	-	-	-	-
<i>V. cholerae</i> non-O1	1	1	-	1	-	-	-	-
<i>V. parahaemolyticus</i>	3	2	-	-	-	2	-	-
<i>Y. enterocolitica</i>	2	-	-	-	-	-	-	-
Total	151	95	64	30	13	10	22	11
CHEMICAL								
Ciguatoxin	8	1	-	-	-	1	-	-
Heavy metals	5	4	-	-	2	-	1	2
Monosodium glutamate	3	2	-	-	-	-	-	2
Mushrooms	4	2	-	-	-	2	-	-
Shellfish	1	1	-	-	-	1	-	-
Scombrototoxin	18	9	5	-	-	5	-	-
Other	8	6	-	-	3	-	-	3
Total	47	25	5	-	5	9	1	7
PARASITIC								
<i>Trichinella spiralis</i>	1	1	-	1	-	1	-	-
Total	1	1	-	1	-	1	-	-
VIRAL								
Hepatitis A	19	14	2	2	-	6	9	3
Norwalk virus	2	2	-	-	-	-	2	-
Total	21	16	2	2	-	6	11	3
CONFIRMED TOTAL	220	137	71	33	18	26	34	21
UNKNOWN	436	225	87	73	35	94	59	16
TOTAL 1982	656	362	158	106	53	120	93	37