ANNUAL SUMMARY 1978
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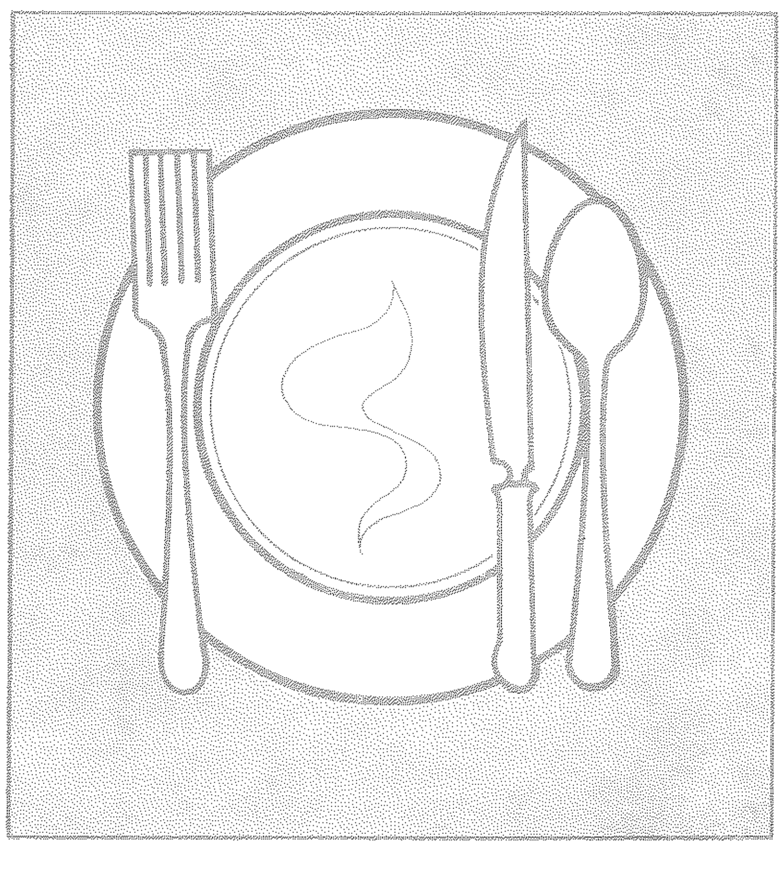
CENTERS FOR DISEASE CONTROL

FOODBORNE DISEASE

SURVEILLANCE



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES • Public Health Service

PREFACE

This report summarizes information received from state and local health departments, the Food and Drug Administration, the U.S. Department of Agriculture, and other pertinent sources. The information is preliminary and is intended primarily for use by those with responsibility for disease control activities. Anyone desiring to quote this report should contact the Enteric Diseases Branch for confirmation and further interpretation.

Contributions to the report are most welcome. Please address them to:

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SUGGESTED CITATION

Centers for Disease Control: Foodborne Disease Outbreaks
Annual Summary 1978, Revised
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This report has been reissued because of numerous tabular errors in the original 1978 Foodborne Disease Surveillance Report released in November 1979. The data from the previous 1978 report should be disregarded and copies should be discarded.

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I. INTRODUCTION

The reporting of foodborne and waterborne diseases in the United States began over half a century ago when state and territorial health officers, concerned about the high morbidity and mortality caused by typhoid fever and infantile diarrhea, recommended that cases of enteric fever be investigated and reported. The purpose was to obtain information about the role of food, milk, and water in outbreaks of intestinal illness as the basis for sound public health action. Beginning in 1923, the United States Public Health Service published summaries of outbreaks of gastrointestinal illness attributed to milk. In 1938, it added summaries of outbreaks caused by all foods. These early surveillance efforts led to the enactment of important public health measures which had a profound influence in decreasing the incidence of enteric diseases, particularly those transmitted by milk and water.

From 1951 through 1960, the National Office of Vital Statistics reviewed reports of outbreaks of foodborne illness and published summaries of them annually in Public Health Reports. In 1961 the Center for Disease Control (CDC), then the Communicable Disease Center, assumed responsibility for publishing reports on foodborne illness. For the period 1961-66 CDC discontinued publication of annual reviews, but reported pertinent statistics and detailed individual investigations in the Morbidity and Mortality Weekly Report (MMWR).

In 1966 the present system of surveillance of foodborne and waterborne diseases began with the incorporation of all reports of enteric disease outbreaks attributed to microbial or chemical contamination of food or water into an annual summary. Since 1966 the quality of investigative reports has improved primarily as a result of more active participation by state and federal agencies in the investigation of foodborne and waterborne disease outbreaks. Due to increasing interest and activity in waterborne disease surveillance, foodborne and waterborne disease outbreaks were reported in separate annual summaries for the first time in 1978. This report summarizes data from the foodborne disease outbreaks reported to the CDC in 1978.

Foodborne disease surveillance has traditionally served 3 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 fundamental prevention and control measures resulting from surveillance of foodborne disease.

2. Knowledge of Disease Causation: The responsible pathogen was not identified in 30% to 60% of foodborne disease outbreaks reported to CDC in each of the last 5 years. In many of these outbreaks, pathogens known to cause foodborne illness may not have been identified because of late or incomplete laboratory investigation. In others, the responsible pathogen may have escaped detection even when a thorough laboratory investigation was carried out because the pathogen is not yet appreciated as a cause of foodborne disease or because it cannot yet be identified by available laboratory techniques. It is probable that these pathogens can be identified and suitable measures to prevent or control diseases caused by them can be instituted if more thorough clinical, epidemiologic, and laboratory investigations are employed. Pathogens suspected of being, but not yet determined to be, etiologic agents in foodborne disease include Group D *Streptococcus*, *Citrobacter*, *Enterobacter*, *Klebsiella*, *Pseudomonas*, and the presumably viral agents of acute infectious non-bacterial gastroenteritis. Other pathogens such as *Escherichia coli*, *Bacillus cereus*, *Yersinia enterocolitica*, *Vibrio parahaemolyticus* and *Campylobacter fetus* subspecies *jejuni* are known causes of foodborne illness, but the extent and importance of their role have not been adequately assessed as yet.

3. Administrative Guidance: The collection of data from outbreak investigations permits assessment of trends in etiologic agents and food vehicles and focuses on common errors in food handling. By compiling the data in an annual summary, it is hoped that local and state health departments and others involved in the implementation of food protection programs will be kept informed of the factors involved in foodborne disease outbreaks. Comprehensive surveillance would result in a clearer appreciation of priorities in food protection, institution of better training programs, and more rational utilization of available resources.

II. FOODBORNE DISEASE OUTBREAKS

In 1978, 481 outbreaks of foodborne disease involving 10,639 cases were reported to the Centers for Disease Control.

A. Definition of Outbreak

For the purpose of this report, a foodborne disease outbreak is defined as an incident in which (1) 2 or more persons experience a similar illness, usually gastrointestinal, after ingestion of a common food, and (2) epidemiologic analysis implicates the food as the source of the illness. There are a few exceptions; 1 case of botulism or chemical poisoning constitutes an outbreak.

1. Laboratory confirmed--Outbreaks in which laboratory evidence of a specific etiologic agent is obtained, and specified criteria are met (see Section G).

2. Undetermined etiology--Outbreaks in which epidemiologic evidence implicates a food source, but adequate laboratory confirmation is not obtained. These outbreaks are subdivided into 4 subgroups by incubation period of the illnesses: less than 1 hour (probable chemical poisoning), 1 to 7 hours (probable Staphylococcus food poisoning), 8 to 14 hours (probable Clostridium perfringens), and greater than 14 hours (infectious or toxic agents).

B. Source of Data

The general public and local, state, and federal agencies which have responsibility for public health and food protection participate in foodborne disease surveillance. Consumers, physicians, hospital personnel, and persons involved with food service or processing report complaints of illness to health departments or regulatory agencies. Local health department personnel (including epidemiologists, sanitarians, and public health nurses) carry out most epidemiologic investigations of these reports and make their findings available to state health departments. State agencies concerned with food safety frequently participate in the initial investigation of the outbreak and offer laboratory support. State or other officials eventually summarize the findings of the investigation on the standard CDC reporting form (see Section E) and send these to CDC (Table 1). Occasionally, on special request, CDC participates in an investigation, particularly if the outbreak is large or involves products that move in interstate commerce.

The 2 federal regulatory agencies that have major responsibilities for food protection, the Food and Drug Administration (FDA) and U.S. Department of Agriculture (USDA), report episodes of foodborne illness to CDC and to state and local health authorities which, in turn, report to FDA or USDA any foodborne disease outbreaks involving commercial products. The U.S. Armed Forces also report outbreaks directly to CDC.

By special arrangement, Connaught Laboratories of Canada, the only commercial producer of botulinal antitoxin in the Western Hemisphere, immediately report all requests for botulinal antitoxin to CDC. This is sometimes the first communication of a botulism outbreak to public health authorities, although physicians are urged to promptly report all suspected botulism cases. In botulism outbreaks, CDC works closely with physicians, state and local health authorities, and FDA or USDA representatives to provide diagnostic and therapeutic consultation and to rapidly identify the responsible food or foods so that proper corrective action can be taken.

C. Interpretation of Data

The limitations on the quantity and quality of data presented here must be appreciated in order to avoid misinterpretation. The number of outbreaks of foodborne disease reported by this surveillance system clearly represents a small fraction of the total number that occur. The likelihood of an outbreak coming to the attention of health authorities varies considerably depending on consumer and physician awareness, interest, and motivation to report the incident.

Not all cases of foodborne illness have an equal likelihood of being reported. For example, interstate outbreaks, large intrastate outbreaks, and outbreaks of serious illness such as botulism or amanitotoxin (mushroom) poisoning 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 given to foodborne surveillance by the state or local health departments. Not only the department's interest in foodborne disease investigation but its investigative and laboratory capabilities are essential determinants of the quality of the investigation. Similarly, the likelihood that the findings of an investigation will be reported varies from one locale to another.

Just as this report should not be the basis of firm conclusions about the absolute incidence of foodborne disease, it should not be used to draw conclusions about the relative incidence of foodborne disease of various etiologies (Table 2). For example, foodborne diseases characterized by short incubation periods such as most outbreaks of chemical etiology or outbreaks caused by staphylococcal enterotoxin are more likely to be recognized

as common-source foodborne disease outbreaks than those diseases with longer incubation periods such as hepatitis A. The relatively small number of outbreaks attributed to parasites and viruses may be due to the long incubation periods of these agents masking the common-source nature of many cases. Similarly, outbreaks involving B. cereus, E. coli, V. parahaemolyticus, Y. enterocolitica, or C. fetus ssp jejuni are probably less likely to be confirmed because these organisms are often not considered in clinical, epidemiologic, and laboratory investigations.

The number of reported outbreaks attributed to some etiologies depends upon the interest of a particular health department or individual. For example, the cholera cases uncovered in Louisiana in 1978 might have been missed if it had not been for the persistence of a laboratory technician who sought aid in identifying an organism which he could not type.

Establishing the true number of deaths caused by foodborne disease outbreaks is difficult because information on deaths in the reports is often incomplete or absent. Further contributing to the under-reporting is the fact that foodborne disease may not be recognized as contributing to the demise of an elderly or debilitated person unable to withstand otherwise minor physical stresses. These limitations on the data must be understood in interpreting Table 3.

In outbreaks of unknown etiology, listed by incubation period (Table 4), the accuracy of reported information is always suspect. In these outbreaks when the epidemiology incriminating a particular food item was very weak, the food was listed as unknown in this report (Table 5). Previously, persons with botulism for which no vehicle could be implicated were included in the foodborne totals. However, in 1978 the definition of foodborne botulism was restricted to cases where a food source was confirmed either by laboratory or epidemiologic evidence. In addition to the 12 foodborne botulism outbreaks, there were 10 botulism outbreaks in 1978 involving 13 persons where no food or wound source could be found.

Information on the place of eating suspect food in foodborne outbreaks was judged to be reliable and was recorded (Table 6). However, information on the place where food was mishandled or improperly cooked or stored in these outbreaks was generally judged unreliable; in many of them the place of mishandling was listed as unknown (Table 7). Only in outbreaks in which a specific etiology was highly suspected, although unconfirmed in the laboratory, and in which the information on mishandling was consistent with the suspected etiology was a known place of mishandling designated.

The implications of a food-processing establishment mishandling food are great both to public health authorities and the establishment concerned. Consequently, the outbreaks attributed to mishandling at these establishments are thoroughly investigated and reported data carefully scrutinized. No foodborne disease outbreaks were linked to mishandling of food at a food processing plant in 1978.

Much is known about contributing factors in foodborne disease. The five most common factors contributing to foodborne disease outbreaks in the United States in order of frequency of occurrence include (1) inadequate cooling of foods, (2) lapse of a day or more between preparing and serving, (3) infected persons handling foods which are not subsequently heat-processed, (4) inadequate time or temperature or both during heat processing foods, and (5) insufficiently high temperature during storage of hot foods (1). For example, in most outbreaks of botulism and trichinosis, the food is usually inadequately heat treated. In most of the outbreaks of bacterial etiology other than botulism and in outbreaks of scrombroid (in which bacterial growth is responsible for toxin production), the food is usually stored at improper holding temperatures. By definition, in outbreaks of ciguatera, puffer fish poisoning, mushroom poisoning, and paralytic and neurotoxic shellfish poisoning, the food itself is unsafe, and illness is not related to improper handling or preparation.

The investigators of foodborne disease outbreaks are usually aware of these contributing factors and consequently seek and find the appropriate answers. Sometimes, however, investigators report factors which are not known to be contributing to outbreaks of the type of etiology confirmed. In such cases the factors are considered in light of the evidence presented; if they are totally unsubstantiated, they are rejected. These considerations must be borne in the mind in interpreting Table 8.

Reference

1. Bryan FA. Factors that contribute to outbreaks of foodborne disease. J Food Protection 1978;41:816-827.

D. Analysis of Data

In 1978, 481 outbreaks of foodborne disease involving 10,639 cases were reported to the CDC Foodborne Disease Surveillance Activity, compared with the 5-year average of 426 outbreaks and 13,709 outbreaks from 1973 to 1977. Outbreaks were reported from 42 states, New York City, Puerto Rico, Guam, and the Virgin Islands. No outbreaks were reported from 8 states or the District of Columbia.

The large number of outbreaks reported by several states and New York City undoubtedly reflects the interest and effort at control of the respective health departments in foodborne disease surveillance. The Washington State Department of Social and Health Services has continued its record of reporting more outbreaks than any other state (Table 1). California, Pennsylvania, and Hawaii again are among the leading states in reporting outbreaks of foodborne disease. New York City has reported more foodborne outbreaks than any other reporting agency since 1975. Connecticut, Maryland, New Mexico, and Virginia reported a substantial increase in the number of outbreaks in 1978.

As has been seen in each of the 5 preceeding years, bacterial agents were the most common causes (68%) of the foodborne outbreaks of confirmed etiology. Following in frequency were chemical agents (24%), parasitic (5%), and viral (3%). The overwhelming majority of confirmed cases (90%) were of bacterial etiology, nearly matching the 5-year average of 91%. Salmonellae accounted for about one-third of the confirmed outbreaks and nearly 40% of the cases, figures consistent with results for 1973 to 1977. The second most common agent was Staphylococcus aureus which was implicated in 15% of the outbreaks and 27% of the total cases.

For the first year since the beginning of foodborne disease reporting, an outbreak of Vibrio cholerae serotype 01 disease was detected in the United States (1). In addition to 1 cluster involving 4 persons, 7 additional individual cases were uncovered, all in Louisiana, with boiled crabs identified as the vehicle.

In 1978, 14 deaths were reported as associated with foodborne outbreaks (Table 3). Four deaths were caused by hepatitis, 3 by botulism, and 7 were caused by diseases of unknown etiology.

The etiologic agent was confirmed in 32% (154/481) of the outbreaks, which is slightly lower than the 5-year average of 40%. Table 4 lists the outbreaks of diseases of undetermined etiology by median incubation periods. If one assumes that most outbreaks in which the median incubation period was less than 1 hour were chemical poisoning, that those in which median incubation period was 1-7 hours were of staphylococcal intoxication, and that those in which the median incubation period was 8-14 hours were caused by C. perfringens, then 60% of the outbreaks of unknown etiology can be accounted for. In addition to these agents, B. cereus, which is rarely considered either from an epidemiologic standpoint or in the laboratory, is associated with 2 separate food poisoning syndromes which closely resemble the more familiar ones caused by S. aureus and C. perfringens (2). Determination of the relative importance of B. cereus infections must await an increased awareness of the potential of the organism to cause foodborne illness.

The vehicle of transmission was identified in 81% of the 154 outbreaks of known etiology. The most common vehicles were meat (39/154) and fish and shellfish (34/154) in outbreaks of bacterial etiology for which a single food item could be identified.

Home canned foods were the most frequently incriminated vehicle in outbreaks of botulism. However, potato salad prepared in commercial food establishments was implicated in 2 outbreaks involving 45 of the 58 cases. Salmonella outbreaks were caused by a variety of vehicles including meat, poultry, dairy products, salads, and Mexican food. Ciguatoxin, the third most frequently reported confirmed agent, caused outbreaks involving mainly coral reef fish. All the outbreaks of paralytic shellfish poisoning were associated with scallops or mussels.

Food eaten in the home (122/481) and restaurants (234/481) accounted for 74% of the 1978 foodborne outbreaks. Of the 105 bacterial outbreaks, 39 were attributed to food eaten in the home and 32 in restaurants. Chemical outbreaks were more likely to occur in the home (21 of 37), and 6 of the parasitic outbreaks occurred in the home.

In 1978 no reports of foodborne outbreaks due to mishandling or improper cooking and storage of food at food processing establishments were reported (Table 7). Mishandling of food at food service establishments accounted for 28% of the outbreaks while mishandling at home was implicated in 8%.

Errors in food handling practices responsible for outbreaks were reported in 75 of the 154 outbreaks of known etiology (Table 8). Improper holding temperatures or inadequate cooking were responsible for most of the outbreaks of bacterial etiology. Poor personal hygiene of a food handler was also frequently reported as a contributing factor, especially

in foodborne shigellosis and in viral hepatitis outbreaks. Inadequate cooking was a factor in all outbreaks due to parasites in which contributing factors were reported.

Since the toxins responsible for ciguatera, mushroom, and paralytic shellfish poisoning are heat stable, thorough cooking of food does not provide protection from these illnesses. Furthermore, there is no practical way to distinguish fish or shellfish containing ciguatoxin or neurotoxin. For these reasons, a place of food mishandling was not specified in outbreaks of ciguatera, mushroom, or shellfish poisoning.

In reviewing the 481 outbreaks, at least 1 contributing factor was implicated in 206 (43%) (Table 8). The data mirrored patterns seen the previous 5 years. In reported outbreaks of botulism, the most frequent error was inadequate cooking of food. Improper holding temperatures most frequently contributed to reported outbreaks of salmonellosis, staphylococcus intoxication, and C. perfringens foodborne illness. Heavy metal poisoning was usually due to storage of acidic beverages in containers or pipes from which metal ions could be leached. In outbreaks of ciguatera, paralytic shellfish, and mushroom poisoning, the foods were unsafe to begin with because they contained toxins.

The date of onset of an outbreak was designated as the date of onset of the first case (Table 9). Certain types of foodborne disease outbreaks showed a definite seasonality (Table 9). For example, outbreaks of paralytic shellfish poisoning occurred in September and October following the peak period of growth of dinoflagellates in the warm summer months.

References

1. Blake PA, Allegra DT, Snyder JD, Barrett TJ, et al. Cholera--a possible endemic focus in the United States. N Engl J Med 1980;302:305-9.

2. Terranova W, Blake PA. Bacillus cereus food poisoning. N Engl J Med 1978; 298;143-4.

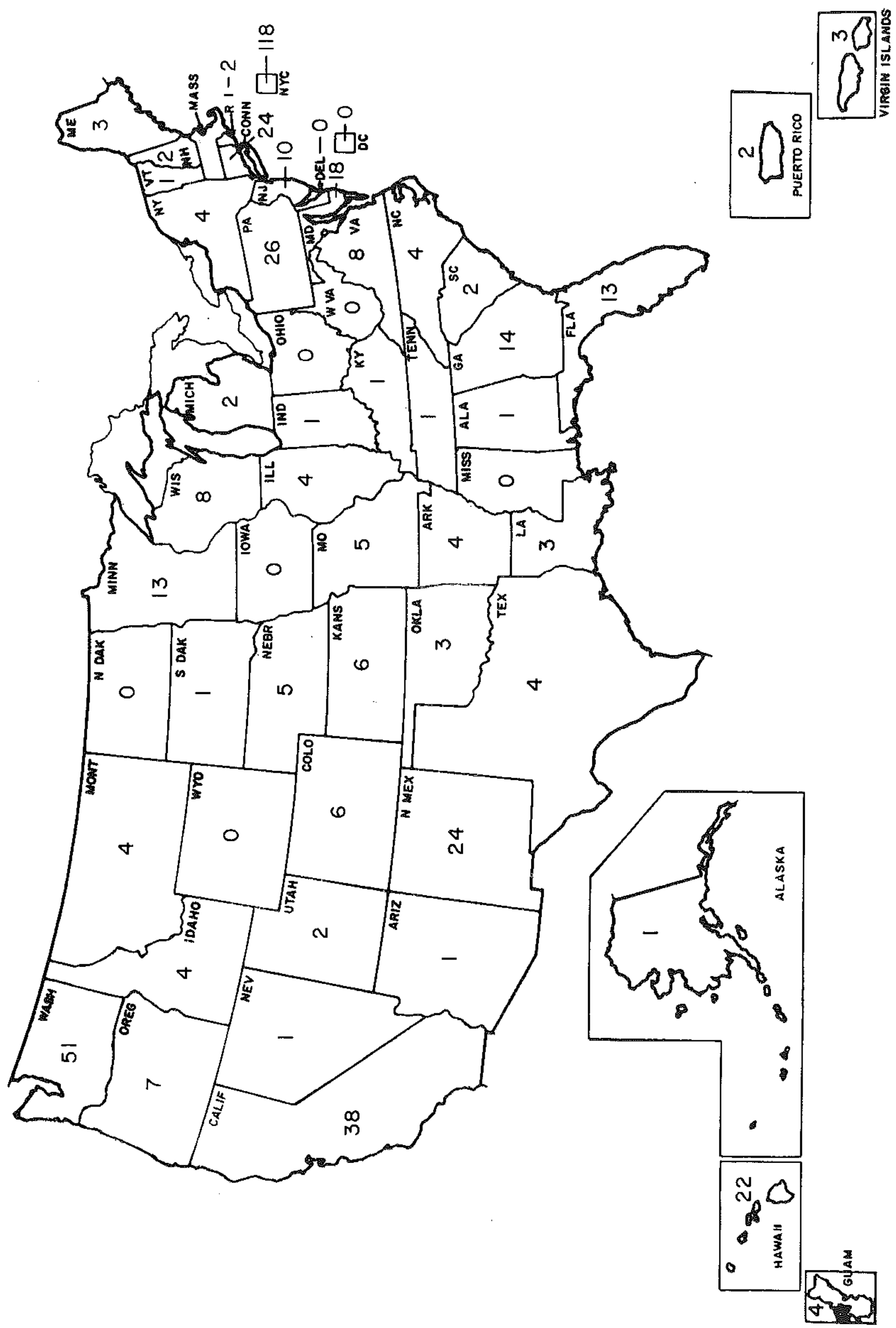

Fig. 1 REPORTED FOODBORNE DISEASE OUTBREAKS, 1978

Table 1
Foodborne Disease Outbreaks, United States, by Location, 1978

State	Number of Outbreaks	State	Number of Outbreaks
Alabama	1	New Jersey	10
Alaska	1	New Mexico	24
Arizona	1	New York City	118
Arkansas	4	New York State	4
California	38	North Carolina	4
Colorado	6	North Dakota	0
Connecticut	24	Ohio	0
Delaware	0	Oklahoma	3
D.C.	0	Oregon	7
Florida	13	Pennsylvania	26
Georgia	14	Puerto Rico	2
Hawaii	22	Rhode Island	2
Idaho	4	South Carolina	2
Illinois	4	South Dakota	1
Indiana	1	Tennessee	1
Iowa	0	Texas	4
Kansas	6	Utah	2
Kentucky	1	Vermont	1
Louisiana	3	Virginia	8
Maine	3	Washington	51
Maryland	18	West Virginia	0
Massachusetts	0	Wisconsin	8
Michigan	2	Wyoming	0
Minnesota	13	Virgin Islands	3
Mississippi	0	Guam	4
Missouri	5	Total	481
Montana	4		
Nebraska	5		
Nevada	1		
New Hampshire	2		

Table 2
Confirmed Foodborne Disease Outbreaks and Cases, and Percents of Known Etiology, 1978

Etiology	Number of Outbreaks	%	No. of Cases	%
BACTERIAL				
B. cereus	6	3.9	248	5.0
Brucella	-	0.0	-	0.0
C. botulinum	12	7.8	58	1.2
C. perfringens	9	5.8	617	12.4
E. coli	1	0.6	35	0.7
Salmonella	45	29.2	1921	38.7
Shigella	4	2.6	159	3.2
S. aureus	23	14.9	1318	26.6
Enterococci	1	0.6	5	0.1
Streptococcus Group A	-	0.0	-	0.0
V. cholerae 01	1	0.6	11	0.2
V. parahaemolyticus	2	1.3	86	1.7
Other bacterial	1	0.6	8	0.2
Total	105	68.2	4466	90.0
CHEMICAL				
Heavy metals	1	0.6	41	0.8
Ciguatoxin	19	12.3	56	1.1
Neurotoxic shellfish poisoning	-	0.0	-	0.0
Paralytic shellfish poisoning	4	2.6	10	0.2
Scrombrotoxin	7	4.5	30	0.6
Monosodium glutamate	-	0.0	-	0.0
Mushroom poisoning	1	0.6	7	0.1
Other chemicals	5	3.2	19	0.4
Total	37	24.0	163	3.3
PARASITIC				
T. spiralis	7	4.5	35	0.7
Total	7	4.5	35	0.7
VIRAL				
Hepatitis A	5	3.2	300	6.0
Total	5	3.2	300	6.0
CONFIRMED TOTAL	154	100.0	4964	100.0

Table 3

Deaths Associated with Foodborne Disease Outbreaks, 1978

Etiology	Number of Deaths
C. botulinum	3
Hepatitis A	4
Unknown	7
Total	14

Table 4

Foodborne Disease Outbreaks of Unknown Etiology, by Incubation Period, 1978

Incubation Period	Number of Outbreaks
<1 hour	13
1-7 hours	109
8-14 hours	74
>15 hours	62
Unknown	69
Total	327

Table 5
Foodborne Disease Outbreaks, by Vehicle of Transmission, and Specific Etiology, 1978

Etiology	Beef	Veal	Lamb	Ham	Pork	Sausage	Chicken	Turkey	Other Meat	Shell Fish	Crustacea	Other Fish	Eggs	Milk
BACTERIAL														
B. cereus	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucella	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. botulinum	-	-	-	-	-	-	-	-	1	-	-	1	-	-
C. perfringens	2	-	-	-	1	-	-	-	-	-	-	-	-	-
E. coli	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Salmonella	3	-	-	-	7	-	1	3	3	-	-	-	-	2
Shigella	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. aureus	-	-	-	10	-	-	-	-	-	-	-	-	-	-
Enterococci	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Streptococcus Group A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V. cholerae	-	-	-	-	-	-	-	-	-	1	-	-	-	-
V. parahaemolyticus	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Other bacterial	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHEMICAL														
Heavy metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ciguatoxin	-	-	-	-	-	-	-	-	-	-	-	19	-	-
Neurotoxic shellfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paralytic shellfish	-	-	-	-	-	-	-	-	-	4	-	-	-	-
Scrombrotoxin	-	-	-	-	-	-	-	-	-	-	-	7	-	-
Monosodium glutamate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mushroom poisoning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other chemicals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PARASITIC														
T. spiralis	3	-	-	-	1	1	-	-	2	-	-	-	-	-
VIRAL														
Hepatitis A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONFIRMED TOTAL	9	-	-	10	9	1	1	3	6	7	-	27	-	2
UNKNOWN	5	-	-	2	1	1	3	-	2	9	-	2	-	-
TOTAL	14	-	-	12	10	2	4	3	8	16	-	29	-	2

Continued on page 11

Table 5 (Cont'd)
Foodborne Disease Outbreaks, by Vehicle of Transmission, and Specific Etiology, 1978

Etiology	Cheese	Egg Nog	Ice Cream	Non Dar Bev	Other Dairy	Baked Foods	Fruits &Vegetables	Potato Salad	Egg Salad	Other Salads	Mushrooms	Chinese Food	Mexican Food	Carbonated Bev	Multiple Foods	Other Foods	Unknown	Total
BACTERIAL																		
B. cereus	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	1	2	6
Brucella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. botulinum	-	-	-	-	-	-	4	1	-	1	-	-	1	-	1	2	-	12
C. perfringens	-	-	-	-	-	-	-	-	-	1	-	-	2	-	1	-	2	9
E. coli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Salmonella	-	1	1	-	1	-	-	1	-	1	-	-	2	-	3	1	15	45
Shigella	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	2	4
S. aureus	-	-	-	-	-	-	-	1	1	5	-	-	-	-	4	-	2	23
Enterococci	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Streptococcus Group A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V. cholerae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
V. parahaemolyticus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Other bacterial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
CHEMICAL																		
Heavy metals	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Ciguatoxin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
Neurotoxic shellfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paralytic shellfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Scrombrotoxin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Monosodium glutamate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mushroom poisoning	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Other chemicals	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	1	5
PARASITIC																		
T. spiralis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
VIRAL																		
Hepatitis A	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	3	5
CONFIRMED TOTAL	-	1	1	2	2	1	5	5	1	9	1	2	7	1	9	4	28	154
UNKNOWN	-	-	1	-	1	4	1	-	1	4	-	5	2	-	6	1	276	327
TOTAL	-	1	2	2	3	5	6	5	2	13	1	7	9	1	15	5	304	481

Table 6
Foodborne Disease Outbreaks, by Place Where Food Was Eaten, and Specific Etiology, 1978

	Home	Restaurant	School	Picnic	Church	Camp	Other or Unknown	Total
BACTERIAL								
B. cereus	1	3	1	-	-	-	1	6
Brucella	-	-	-	-	-	-	-	-
C. botulinum	9	3	-	-	-	-	-	12
C. perfringens	3	5	-	-	-	-	1	9
E. coli	-	-	-	-	-	1	-	1
Salmonella	19	15	2	1	-	-	8	45
Shigella	1	1	-	-	-	-	2	4
S. aureus	4	4	5	2	2	-	6	23
Enterococci	-	1	-	-	-	-	-	1
Streptococcus Group A	-	-	-	-	-	-	-	-
V. cholerae 01	1	-	-	-	-	-	-	1
V. parahaemolyticus	-	-	-	-	1	-	1	2
Other bacteria	1	-	-	-	-	-	-	1
Total	39	32	8	3	3	1	19	105
CHEMICAL								
Heavy metals	-	-	-	1	-	-	-	1
Ciguatoxin	15	3	-	-	-	-	1	19
Neurotoxic shellfish	-	-	-	-	-	-	-	-
Paralytic shellfish	3	-	-	-	-	-	1	4
Scrombrotoxin	1	3	-	-	-	-	3	7
Monosodium glutamate	-	-	-	-	-	-	-	-
Mushroom poisoning	1	-	-	-	-	-	-	1
Other chemicals	1	1	-	1	-	-	2	5
Total	21	7	-	2	-	-	7	37
PARASITIC								
T. spiralis	6	-	-	-	-	-	1	7
Total	6	-	-	-	-	-	1	7
VIRAL								
Hepatitis A	1	3	-	-	-	-	1	5
Total	1	3	-	-	-	-	1	5
CONFIRMED TOTAL	67	42	8	5	2	1	29	154
UNKNOWN	55	192	10	4	1	6	59	327
TOTAL 1978	122	234	18	9	3	7	88	481

Table 7
Foodborne Disease Outbreaks, by Place Where Food Was Mishandled, and Specific Etiology, 1978

	Food Processing Establishments	Food Service Establishments	Homes	Unknown	Not Applicable	Total
BACTERIAL						
B. cereus	-	4	1	1	-	6
Brucella	-	-	-	-	-	-
C. botulinum	-	1	6	5	-	12
C. perfringens	-	7	2	-	-	9
E. coli	-	1	-	-	-	1
Salmonella	-	19	5	21	-	45
Shigella	-	-	1	3	-	4
S. aureus	-	13	3	7	-	23
Enterococci	-	1	-	-	-	1
Streptococcus Group A	-	-	-	-	-	-
V. cholerae 01	-	-	1	-	-	1
V. parahaemolyticus	-	-	-	2	-	2
Other bacterial	-	-	-	1	-	1
Total	-	46	19	40	-	105
CHEMICAL						
Heavy metals	-	-	1	-	-	1
Ciguatoxin	-	-	-	-	19	19
Neurotoxic shellfish	-	-	-	-	-	-
Paralytic shellfish	-	-	-	-	4	4
Scrombrotoxin	-	2	-	5	-	7
Monosodium glutamate	-	-	-	-	-	-
Mushroom poisoning	-	-	-	-	1	1
Other chemicals	-	4	1	-	-	5
Total	-	6	2	5	24	37
PARASITIC						
T. spiralis	-	-	-	-	7	7
Total	-	-	-	-	7	7
VIRAL						
Hepatitis A	-	2	-	3	-	5
Total	-	2	-	3	-	5
CONFIRMED TOTAL	-	54	21	48	31	154
UNKNOWN	-	82	17	228	-	327
TOTAL 1978	-	136	38	276	31	481

Table 8
Foodborne Disease Outbreaks, by Contributing Factors, and Etiology, 1978

	Number of Reported Outbreaks	Number of Outbreaks in Which Factors Reported	Improper Holding Temperatures	Inadequate Cooking	Contaminated Equipment	Food From Unsafe Source	Poor Personal Hygiene	Other
BACTERIAL								
B. cereus	6	4	4	1	1	-	-	-
Brucella	-	-	-	-	-	-	-	-
C. botulinum	12	7	-	7	-	-	-	1
C. perfringens	9	8	8	4	2	-	1	3
E. coli	1	1	1	1	1	-	-	-
Salmonella	45	23	16	12	11	3	9	4
Shigella	4	1	1	-	-	-	1	-
S. aureus	23	15	15	2	3	1	6	2
Enterococci	1	-	-	-	-	-	-	-
Streptococcus Group A	-	-	-	-	-	-	-	-
V. cholerae 01	1	1	1	1	-	-	-	-
V. parahaemolyticus	2	1	1	-	-	-	-	1
Other bacterial	1							
Total	105	61	47	28	18	4	17	11
CHEMICAL								
Heavy Metal	1	-	-	-	-	-	-	-
Ciguatoxin	19	-	-	-	-	-	-	-
Neurotoxic shellfish	-	-	-	-	-	-	-	-
Paralytic shellfish	4	4	-	-	-	4	-	1
Scrombrotoxin	7	2	2	-	-	-	-	-
Monosodium glutamate	-	-	-	-	-	-	-	-
Mushroom poisoning	1	-	-	-	-	-	-	-
Other chemicals	5	2	1	-	1	-	1	1
Total	37	8	3	-	1	4	1	2
PARASITIC								
T. spiralis	7	3	-	3	-	-	-	-
Total	7	3	-	3	-	-	-	-
VIRAL								
Hepatitis A	5	2	-	-	-	-	2	-
Total	5	2	-	-	-	-	2	-
CONFIRMED TOTAL	154	74	50	31	19	8	20	13
UNKNOWN	327	132	100	22	26	8	43	19
TOTAL 1978	481	206	150	53	45	16	63	32

Table 9
Foodborne Disease Outbreaks, by Month of Occurrence, and Specific Etiology, 1978

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown	Total
BACTERIAL														
B. cereus	-	-	-	-	-	1	1	1	-	-	3	-	-	6
Brucella	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. botulinum	2	1	-	2	1	1	-	1	-	2	2	-	-	12
C. perfringens	-	1	1	-	1	1	-	1	1	1	-	2	-	9
E. coli	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Salmonella	1	1	2	3	2	5	4	7	4	6	4	4	2	45
Shigella	-	-	-	-	-	-	-	-	-	-	-	2	2	4
S. aureus	-	-	3	-	-	2	1	6	1	2	6	2	-	23
Enterococci	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Streptococcus Group A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V. cholerae 01	-	-	-	-	-	-	-	-	1	-	-	-	-	1
V. parahaemolyticus	-	-	-	1	-	1	-	-	-	-	-	-	-	2
Other bacterial	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	4	3	6	6	4	11	6	16	8	11	15	11	4	105
CHEMICAL														
Heavy metals	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Ciguatoxin	5	1	-	1	-	-	4	-	3	-	1	4	-	19
Neurotoxic shellfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paralytic shellfish	-	-	-	-	-	-	-	-	3	1	-	-	-	4
Scrombrotoxin	1	-	3	-	2	-	-	-	1	-	-	-	-	7
Monosodium glutamate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mushroom poisoning	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Other chemicals	1	-	-	1	-	1	-	-	1	1	-	-	-	5
Total	8	1	3	2	2	2	4	-	8	2	1	4	-	37
PARASITIC														
T. spiralis	-	-	-	-	2	-	1	-	1	1	-	1	1	7
Total	-	-	-	-	2	-	1	-	1	1	-	1	1	7
VIRAL														
Hepatitis A	-	-	-	-	2	-	-	1	-	-	2	-	-	5
Total	-	-	-	-	2	-	-	1	-	-	2	-	-	5
CONFIRMED TOTAL	12	4	9	8	10	13	11	17	17	14	18	16	5	154
UNKNOWN	24	21	26	42	32	33	21	21	21	12	29	27	18	327
TOTAL 1978	36	25	35	50	42	46	32	38	38	26	47	43	23	481

This report is authorized by law (Public Health Service Act, 42 USC 241). While your response is voluntary, your cooperation is necessary for the understanding and control of the disease.

FORM APPROVED
OMB NO. 68-R567

INVESTIGATION OF A FOODBORNE OUTBREAK

1. Where did the outbreak occur?
State ____________ (1,2) City or Town ____________ County ____________

2. Date of outbreak: (Date of onset 1st case)
____________ (3-8)

3. Indicate actual (a) or estimated (e) numbers:
Persons exposed ____________ (9-11)
Persons ill ____________ (12-14)
Hospitalized ____________ (15-16)
Fatal cases ____________ (17)

4. History of Exposed Persons:
No. histories obtained ____________ (18-20)
No. persons with symptoms ____________ (21-23)
Nausea ______ (24-26) Diarrhea ______ (33-35)
Vomiting ______ (27-29) Fever ______ (36-38)
Cramps ______ (30-32) Other, specify ____________
____________ (39)

5. Incubation period (hours):
Shortest ______ (40-42) Longest ______ (43-45)
Approx. for majority ____________ (46-48)

6. Duration of illness (hours):
Shortest ______ (49-51) Longest ______ (52-54)
Approx. for majority ____________ (55-57)

7. **Food-specific attack rates: (58)**

Food Items Served	Number of persons who ATE specified food				Number who did NOT eat specified food			
	Ill	Not Ill	Total	Percent ill	Ill	Not Ill	Total	Percent ill

8. Vehicle responsible (food item incriminated by epidemiological evidence): (59,60) ____________

9. Manner in which incriminated food was marketed: (Check all applicable)

(a) Food Industry (61)
- Raw ☐ 1
- Processed ☐ 2

Home Produced
- Raw ☐ 3
- Processed ☐ 4

(b) Vending Machine ☐ 1 (62)

(c) Not wrapped ☐ 1 (63)
- Ordinary Wrapping ☐ 2
- Canned ☐ 3
- Canned--Vacuum Sealed ☐ 4
- Other (specify) ☐ 5

____

(d) Room Temperature ☐ 1 (64)
- Refrigerated ☐ 2
- Frozen ☐ 3
- Heated ☐ 4

If a commercial product, indicate brand name and lot number
____

10. Place of Preparation of Contaminated Item: (65)
- Restaurant ☐ 1
- Delicatessen ☐ 2
- Cafeteria ☐ 3
- Private Home ☐ 4
- Caterer ☐ 5
- Institution:
  - School ☐ 6
  - Church ☐ 7
  - Camp ☐ 8
- Other, specify ☐ 9

____

11. Place where eaten: (66)
- Restaurant ☐ 1
- Delicatessen ☐ 2
- Cafeteria ☐ 3
- Private Home ☐ 4
- Picnic ☐ 5
- Institution:
  - School ☐ 6
  - Church ☐ 7
  - Camp ☐ 8
- Other, specify ☐ 9

____

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL
BUREAU OF EPIDEMIOLOGY
ATLANTA, GEORGIA 30333

CDC 4.245
1-74

(Over)

LABORATORY FINDINGS (Include Negative Results)

12. Food specimens examined: (67)
Specify by "X" whether food examined was original (eaten at time of outbreak) or check-up (prepared in similar manner but not involved in outbreak)

Item	Orig.	Check up	Findings Qualitative	Quantitative
Example: beef	X		C. perfringens, Hobbs type 10	$2X10^6$/gm

13. Environmental specimens examined: (68)

Item	Findings
Example: meat grinder	C. perfringens, Hobbs Type 10

14. Specimens from patients examined (stool, vomitus, etc.): (69)

Item	No. Persons	Findings
Example: stool	11	C. perfringens, Hobbs Type 10

15. Specimens from food handlers (stool, lesions, etc.): (70)

Item	Findings
Example: lesion	C. perfringens, Hobbs type 10

16. Factors contributing to outbreak (check all applicable):

	Yes	No	
1. Improper storage or holding temperature	☐ 1	☐ 2	(71)
2. Inadequate cooking	☐ 1	☐ 2	(72)
3. Contaminated equipment or working surfaces	☐ 1	☐ 2	(73)
4. Food obtained from unsafe source	☐ 1	☐ 2	(74)
5. Poor personal hygiene of food handler	☐ 1	☐ 2	(75)
6. Other, specify ____________	☐ 1	☐ 2	(76)

17. Etiology: (77, 78)
Pathogen ____________
Chemical ____________
Other ____________

Suspected ☐ 1 (79)
Confirmed ☐ 2
Unknown ☐ 3

18. Remarks: Briefly describe aspects of the investigation not covered above, such as unusual age or sex distribution; unusual circumstances leading to contamination of food, water; epidemic curve; etc. (Attach additional page if necessary)

Name of reporting agency: (80)

Investigating official: | **Date of investigation:**

NOTE: Epidemic and Laboratory Assistance for the investigation of a foodborne outbreak is available upon request by the State Health Department to the Center for Disease Control, Atlanta, Georgia 30333.

To improve national surveillance, please send a copy of this report to:
Center for Disease Control
Attn: Enteric Diseases Branch, Bacterial Diseases Division
Bureau of Epidemiology
Atlanta, Georgia 30333

Submitted copies should include as much information as possible, but the completion of every item is not required.

CDC 4.245 (BACK)
1-74

F. LINE LISTING OF FOODBORNE DISEASE OUTBREAKS

1978

F. LINE LISTING OF FOODBORNE DISEASE OUTBREAKS, 1978

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-handler	Vehicle	Location Where Food Mishandled* and Eaten
BACTERIAL								
BACILLUS CEREUS								
B. cereus	Alabama	8	11/08		+		Unknown	(B) Restaurant
B. cereus	California	11	11/25				Mexican food	(B) Restaurant
B. cereus	Connecticut	4	7/12		+	+	Chinese food	(B) Office
B. cereus	Connecticut	12	8/15	+	+		Fried rice	(B) Restaurant
B. cereus	New Mexico	4	6/02		+		Tuna twist	(C) Home
B. cereus	North Carolina	209	11/21	+	+		Unknown	(D) School
CLOSTRIDIUM BOTULINUM								
C. botulinum	California	1	6/?		+		Home canned lupino beans	(C) Home
C. botulinum	California	2	10/31		+		Olives	(C) Home
C. botulinum	Colorado	1	1/?	+			Pork and beans	(D) Home
C. botulinum	Colorado	8	11/13		+		Potato salad	(D) Restaurant
C. botulinum	Georgia	1	5/21				Bar-B-Q beef	(D) Home
C. botulinum	New Mexico	34	4/09		+		3 Bean salad, potato salad	(D) Restaurant
C. botulinum	Pennsylvania	2	4/24				Peppers	(C) Home
C. botulinum	Texas	3	1/14				Soup	(D) Home
C. botulinum	Texas	1	2/06				Mexican food	(C) Home
C. botulinum	Virginia	1	10/23				Pickled beans	(C) Home
C. botulinum	Wisconsin	1	11/09				Spaghetti sauce	(C) Home
C. botulinum	Puerto Rico	3	8/04				Marinated fish	(B) Restaurant
CLOSTRIDIUM PERFRINGENS								
C. perfringens	California	18	8/19		+		Unknown	(C) Home
C. perfringens	Georgia	2	9/14		+		Beef	(B) Restaurant
C. perfringens	Georgia	2	12/23	+	+	+	Pork	(B) Home
C. perfringens	North Carolina	16	2/22	+	+		Unknown	(B) Sorority Hall
C. perfringens	Utah	50	3/20	+	+		Mexican food	(B) Restaurant
C. perfringens	Washington	500	5/14	+			Shrimp newberg	(B) Restaurant
C. perfringens	Washington	5	10/02	+			Beef	(B) Restaurant
C. perfringens	Washington	4	12/31	+			Mexican food	(B) Restaurant
C. perfringens	Wisconsin	20	6/18		+		Beef and gravy	(C) Home
ESCHERICHIA COLI								
E. coli	Oregon	35	9/17	+	+		Beef	(B) Camp
SALMONELLA								
S. typhimurium	Arizona	23	10/?				Milk	(D) Home
S. enteritidis	Arkansas	7	5/14	+	+	+	Mayonnaise	(C) Home
S. cubana	California	5	3/06	+	+		Pork	(D) Drive In
S. cubana	California	13	3/12	+	+	+	Pork	(B) Home
S. heidelberg	California	55	7/02	+		+	Pork	(B) Other
S. enteritidis	California	58	7/19	+	+	+	Unknown	(D) Restaurant
S. schwarzengrund	California	9	8/20	+	+	+	Pork	(B) Home
S. typhimurium	California	34	11/20	+			Turkey & dressing	(B) Club Lodge
S. typhimurium	Colorado	7	1/18				Milk	(D) Other
S. typhimurium	Connecticut	11	5/30	+	+		Chicken	(C) Home

*(A)--Food processing establishment; (B)--Food service establishment; (C)--Home; (D)--Unknown; (E)--Not applicable

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
S. montevideo	Georgia	3	4/30	+		+	Mexican food	(D) Restaurant
S. derby	Georgia	7	8/18	+	+		Pork	(B) Home
S. javiana	Georgia	756	11/05	+	+	+	Bar-B-Q pork	(B) School
S. derby	Georgia	7	12/17	+			Unknown	(B) Restaurant
S. javiana	Georgia	2	12/23	+			Pork	(B) Restaurant
S. agona	Kansas	6	8/05	+			Mexican food	(D) Restaurant
S. heidelberg	Minnesota	17	9/24		+		Hamburger casserole	(B) Home
S. agona	Minnesota	34	12/?		+	+	Unknown	(D) Restaurant
S. typhimurium	Nebraska	6	8/09		+		Chicken salad	(D) Restaurant
S. enteritidis	Nevada	3	6/?	+			Unknown	(D) Unknown
S. enteritidis	New Hampshire	4	10/05				Unknown	(D) Restaurant
S. typhimurium	New Jersey	26	10/29	+	+	+	Goat	(C) Home
S. (not defined)	New Mexico	3	9/04	+			Instant milk	(B) Home
S. (not defined)	New Mexico	5	?/?	+			Unknown	(D) Restaurant
S. (not defined)	New Mexico	5	?/?				Pork	(D) Home
S. (not defined)	Oklahoma	8	6/25	+			Unknown	(C) Home
S. enteritidis	Oregon	4	8/25				Unknown	(D) Restaurant
S. typhimurium	Pennsylvania	5	4/06	+	+		Egg nog	(D) Home
S. typhimurium	Pennsylvania	46	6/25	+			Beef	(D) Home
S. typhimurium	Pennsylvania	50	6/26	+			Unknown	(D) Home
S. heidelberg	Pennsylvania	8	7/13	+			Turkey	(D) Restaurant
S. typhimurium	Pennsylvania	13	9/11	+			Unknown	(D) Home
S. enteritidis	Tennessee	200	2/14	+		+	Turkey	(D) Club Lodge
S. typhimurium	Virginia	7	7/30	+	+		Ice cream	(C) Home

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
S. typhimurium	Virginia	28	8/13	+	+	+	Unknown	(B) Home
S. typhimurium	Virginia	110	11/12	+	+		Turkey	(B) Natl Gd Armory
S. muenster	Washington	27	10/03	+		+	Turkey sandwiches	(B) Restaurant
S. typhimurium	Wisconsin	108	8/06	+			Potato salad	(B) Picnic
S. reading	Wisconsin	137	11/22	+			Potatoes & gravy	(B) School
S. enteritidis	Wisconsin	11	12/15				Unknown	(B) Home
S. typhimurium	Guam	29	9/?	+			Unknown	(D) Wedding
S. (not defined)	New York City	12	4/23				Unknown	(D) Home
S. muenster	New York City	6	6/19				Unknown	(B) Restaurant
S. anatum	New York City	4	10/05		+		Beef	(B) Restaurant
S. montevideo	New York City	2	10/23	+	+	+	Beef	(B) Restaurant
SHIGELLA								
S. sonnei	Illinois	117	12/15	+			Potato salad	(C) Banquet hall
S. sonnei	Illinois	36	12/28	+			Unknown	(D) Banquet hall
S. sonnei	New Mexico	2	?/?				Unknown	(D) Restaurant
S. sonnei	New Mexico	4	?/?				Chicken salad	(D) Home
STAPHYLOCOCCUS								
S. aureus	California	28	12/22	+	+		Rice-shrimp-bacon dish	(D) Pot luck dinner
S. aureus	Connecticut	13	10/03		+	+	Egg salad	(D) Hospital
S. aureus	Florida	54	11/23		+		Ham	(B) School
S. aureus	Georgia	50	6/24		+		Ham	(D) Picnic
S. aureus	Georgia	215	6/27			+	Chicken salad	(B) School

*(A)--Food processing establishment; (B)--Food service establishment; (C)--Home; (D)--Unknown; (E)--Not applicable

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
S. aureus	Georgia	4	8/10		+		Ham	(B) Home
S. aureus	Georgia	13	9/01		+		Ham	(B) School
S. aureus	Kansas	2	10/16		+	+	Unknown	(D) Restaurant
S. aureus	Kentucky	161	11/27	+		+	Chicken salad	(B) Sr Citizen Ctr
S. aureus	Maryland	21	8/06		+		Ham	(B) Restaurant
S. aureus	Missouri	6	11/12		+		Ham	(C) Home
S. aureus	New York	104	8/29		+		Tuna salad, macaroni salad	(B) Jail
S. aureus	New York	116	11/10	+	+		Turkey salad	(B) School
S. aureus	North Carolina	257	11/16		+		Chicken salad	(B) Prison
S. aureus	Oklahoma	118	3/03	+	+	+	Potato salad, carrot salad	(B) School
S. aureus	Pennsylvania	29	8/25		+		Ham	(D) Church
S. aureus	Pennsylvania	11	8/26		+		Potato salad	(B) Church
S. aureus	Pennsylvania	24	11/11	+			Unknown	(D) Club lodge
S. aureus	South Carolina	58	7/30	+	+	+	Ham	(B) Picnic
S. aureus	Washington	2	3/06		+		Crab salad	(D) Restaurant
S. aureus	Washington	5	8/13	+	+		Ham	(B) Restaurant
S. aureus	Wisconsin	2	3/26		+		Ham	(C) Home
S. aureus	New York City	25	12/?		+		Chicken & rice	(C) Home
STREPTOCOCCUS								
Enterococci	California	5	12/06				Mexican food	(B) Restaurant

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
VIBRIOS								
V. cholerae 01	Louisiana	11	9/?		+		Crabs	(C) Home
V. parahaemolyticus	Louisiana	82	6/21	+	+		Shrimp	(D) Other
V. parahaemolyticus	Guam	4	4/07				Shrimp	(D) Other
OTHER BACTERIAL	Utah	8	1/?	+	+		Unknown	(D) Home
CHEMICAL								
Metal	Missouri	41	6/15		+		Peach Koolaid	(C) Picnic
Ciguatoxin	Florida	3	1/05				Grouper	(E) Home
Ciguatoxin	Florida	3	7/20	+			Barracuda	(E) Restaurant
Ciguatoxin	Hawaii	2	1/09				Amberjack	(E) Home
Ciguatoxin	Hawaii	5	1/31				Amberjack	(E) Home
Ciguatoxin	Hawaii	2	4/30				Amberjack	(E) Home
Ciguatoxin	Hawaii	2	7/04				Goat fish	(E) Home
Ciguatoxin	Hawaii	3	7/16		+		Goat fish	(E) Home
Ciguatoxin	Hawaii	4	7/29				Amberjack	(E) Other
Ciguatoxin	Hawaii	2	9/20		+		Mullet	(E) Home
Ciguatoxin	Hawaii	1	9/22				Goat fish	(E) Home
Ciguatoxin	Hawaii	2	9/25		+		Gray snapper	(E) Home
Ciguatoxin	Hawaii	3	11/20		+		Goat fish	(E) Home
Ciguatoxin	Hawaii	5	12/12				Amberjack	(E) Home
Ciguatoxin	Hawaii	2	12/26		+		Porgy	(E) Restaurant
Ciguatoxin	Hawaii	2	12/29				Snapper	(E) Home

*(A)--Food processing establishment; (B)--Food service establishment; (C)--Home; (D)--Unknown; (E)--Not applicable

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
Ciguatoxin	Virgin Islands	7	1/04				Red snapper	(E) Restaurant
Ciguatoxin	Virgin Islands	1	1/15		+		Grouper	(E) Home
Ciguatoxin	Virgin Islands	6	2/11		+		Grouper	(E) Home
Ciguatoxin	Puerto Rico	1	12/06		+		Snapper	(E) Home
Paralytic shellfish	Washington	2	9/20				Mussels	(E) Home
Paralytic shellfish	Washington	3	9/23		+		Mussels	(E) Home
Paralytic shellfish	Washington	1	9/26				Mussels	(E) Home
Paralytic shellfish	Washington	4	10/03		+		Scollops	(E) Lab
Scombrotoxin	Hawaii	2	1/27				Mahi-Mahi	(B) Restaurant
Scombrotoxin	Hawaii	2	3/01		+		Mahi-Mahi	(D) Home
Scombrotoxin	Hawaii	13	3/10		+		Mahi-Mahi	(D) Hospital
Scombrotoxin	Hawaii	4	3/17				Mahi-Mahi	(D) Hospital
Scombrotoxin	Hawaii	1	5/10				Mahi-Mahi	(D) Hotel
Scombrotoxin	Hawaii	1	5/16				Mahi-Mahi	(D) Restaurant
Scombrotoxin	Hawaii	7	9/03				Mahi-Mahi	(B) Restaurant
Mushroom poisoning	California	7	1/?	+	+	+	Mushrooms	(E) Home
Other Chemical	California	2	10/04		+		Unknown	(B) Restaurant
Other Chemical	Colorado	9	4/27		+		Choc. bundt cake	(C) Office party
Other Chemical	New Jersey	2	9/10		+		Popsicle	(B) Home
Other Chemical	New Mexico	4	6/04		+		Lemonade	(B) Picnic
Other Chemical	New York City	2	1/18				Fruit cup	(B) Office

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
PARASITIC								
TRICHINELLA SPIRALIS								
T. spiralis	Alaska	23	?/?				Bear meat	(E) Home
T. spiralis	California	2	9/24				Pork	(E) Camping trip
T. spiralis	California	2	10/02		+		Bar-B-Q spare ribs	(E) Home
T. spiralis	Connecticut	2	7/18		+		Beef	(E) Home
T. spiralis	New York	2	5/14		+		Beef	(E) Home
T. spiralis	Rhode Island	2	12/23		+		Sausage	(E) Home
T. spiralis	New York City	2	5/12		+		Beef	(E) Home
VIRAL								
Hepatitis A	Arkansas	82	11/?			+	Unknown	(D) Restaurant
Hepatitis A	California	36	5/?		+		Orange juice	(D) Home
Hepatitis A	Louisiana	33	5/19				Unknown	(B) Restaurant
Hepatitis A	Minnesota	91	8/?	+	+		Potato salad	(B) Country club
Hepatitis A	Texas	58	11/?			+	Unknown	(D) Restaurant
UNKNOWN								
	Arkansas	23	4/27				Bar-B-Q Chicken/Pork	(B) Restaurant
	Arkansas	88	8/21	+			Unknown	(D) School
	California	3	1/14				Unknown	(D) Home
	California	6	1/24				Unknown	(D) Restaurant
	California	2	2/19				Clams	(C) Home
	California	2	3/04				Unknown	(D) Home

*(A)--Food processing establishment; (B)--Food service establishment; (C)--Home; (D)--Unknown; (E)--Not applicable

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
UNKNOWN	California	3	4/12				Unknown	(D) Restaurant
	California	87	4/19				Unknown	(B) Camp
	California	25	4/24		+		Fruit salad	(D) Office
	California	2	4/25				Unknown	(C) Home
	California	15	4/30				Unknown	(D) Restaurant
	California	12	5/30	+			Ice cream	(D) Home
	California	4	6/05				Unknown	(D) Restaurant
	California	5	6/07				Unknown	(D) Home
	California	2	6/11				Unknown	(B) Restaurant
	California	17	7/21		+	+	Ham & turkey salad	(D) Office
	California	5	7/26				Unknown	(D) Home
	California	6	8/16				Unknown	(D) Restaurant
	California	7	8/19				Salad dressing	(B) Restaurant
	California	10	9/11				Pizza	(B) Restaurant
	California	8	9/19				Unknown	(D) Office
	California	40	10/20				Unknown	(D) Sr.Citizen Ctr
	California	12	11/05				Unknown	(D) Restaurant
	Colorado	15	6/05				Unknown	(D) Home
	Colorado	9	11/18				Unknown	(B) Restaurant
	Connecticut	2	2/05				Unknown	(B) Restaurant
	Connecticut	10	2/10		+		Unknown	(B) Restaurant
	Connecticut	12	3/11				Unknown	(D) Other
	Connecticut	45	4/02				Unknown	(D) Restaurant
	Connecticut	21	4/02				Unknown	(D) Restaurant

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
	Connecticut	2	4/10				Chinese food	(B) Home
	Connecticut	21	4/16				Unknown	(D) Home
	Connecticut	4	4/24				Unknown	(D) Restaurant
	Connecticut	142	5/05				Unknown	(D) School
	Connecticut	23	5/16		+		Clams	(B) Restaurant
	Connecticut	17	5/20				Unknown	(D) Restaurant
	Connecticut	4	5/28				Clams	(D) Restaurant
	Connecticut	10	5/29				Clams	(D) Picnic
	Connecticut	6	5/29				Clams	(D) Picnic
	Connecticut	2	7/19				Clams	(B) Other
	Connecticut	4	9/05				Unknown	(D) Restaurant
	Connecticut	35	9/10		+		Beef	(D) Restaurant
	Connecticut	19	12/10				Unknown	(B) Restaurant
	Connecticut	14	12/22				Fried rice	(D) Other
	Florida	2	1/12				Unknown	(C) Home
	Florida	10	3/12				Unknown	(D) Restaurant
	Florida	2	3/?				Unknown	(D) Delicatessen
	Florida	3	4/05				Unknown	(D) Other
	Florida	8	4/08				Unknown	(D) Home
	Florida	2	4/09				Unknown	(D) Unknown
	Florida	11	6/19				Unknown	(D) Restaurant
	Florida	11	6/20				Unknown	(D) Restaurant
	Florida	2	10/21				Unknown	(D) Picnic
	Florida	8	10/30				Unknown	(D) Restaurant

*(A)--Food processing establishment; (B)--Food service establishment; (C)--Home; (D)--Unknown; (E)--Not applicable

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
UNKNOWN	Georgia	60	1/15				Unknown	(B) Restaurant
	Georgia	200	9/25				Unknown	(B) Other
	Hawaii	17	4/28				Seafood newberg	(B) Restaurant
	Hawaii	15	11/28				Unknown	(D) Other
	Idaho	35	8/07				Unknown	(D) Unknown
	Idaho	5	8/09				Unspecified meat	(B) Restaurant
	Idaho	12	8/12				Unknown	(D) Camp
	Idaho	24	8/13				Unknown	(D) Restaurant
	Illinois	74	8/05		+		Unspecified fish	(C) Home
	Illinois	21	11/30	+			Unknown	(B) Restaurant
	Indiana	74	8/15				Ham	(C) Home
	Kansas	9	4/24				Unknown	(D) Other
	Kansas	5	6/18				Unknown	(D) Home
	Kansas	14	6/25				Unknown	(B) Other
	Kansas	3	11/20				Unknown	(D) Other
	Maine	27	2/17				Unknown	(D) Other
	Maine	27	3/01				Unknown	(D) Unknown
	Maine	39	6/04				Unknown	(D) Home
	Maryland	24	3/24				Unknown	(B) Other
	Maryland	150	4/29				Unknown	(D) Restaurant
	Maryland	25	4/?				Unknown	(D) Restaurant
	Maryland	3	5/17				Unknown	(D) Home
	Maryland	135	6/13				Unknown	(B) Other
	Maryland	6	7/08				Unknown	(C) Home

	Maryland	50	7/18	+			Unknown	(B) Camp
	Maryland	2	8/15				Unknown	(B) Restaurant
	Maryland	15	9/10				Unknown	(B) Restaurant
	Maryland	42	10/28				Unknown	(B) Other
	Maryland	2	11/06				Unknown	(D) Restaurant
	Maryland	100	11/23				Turkey & dressing	(B) Restaurant
	Maryland	2	11/25				Unknown	(D) Restaurant
	Maryland	38	12/05				Unknown	(D) Restaurant
	Maryland	29	12/13				Unknown	(B) Restaurant
	Maryland	14	12/15				Unknown	(D) School
	Maryland	57	12/23	+			Unknown	(B) Restaurant
	Michigan	9	2/26	+	+		Beef	(B) Restaurant
	Michigan	110	4/21				Unknown	(B) School
	Minnesota	6	3/26				Unknown	(D) Home
	Minnesota	22	3/31				Cornish hens/dressing	(B) Restaurant
	Minnesota	2	5/18		+		Unknown	(B) Other
	Minnesota	2	7/09				Chinese food	(C) Home
	Minnesota	16	8/22		+		Unspec. baked food	(C) Home
	Minnesota	5	8/25				Chinese food	(B) Restaurant
	Minnesota	3	9/22				Unknown	(B) Restaurant
	Minnesota	15	10/26				Mexican food	(B) Restaurant
	Minnesota	9	10/27				Sausage	(B) Restaurant
	Minnesota	2	12/21				Unknown	(D) Restaurant
	Missouri	31	3/16				Unknown	(D) Restaurant

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Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
UNKNOWN	Missouri	47	6/17				Unknown	(D) Nursing home
	Missouri	8	11/14				Seafood platter	(D) Restaurant
	Montana	45	5/06				Beef stroganoff	(B) Restaurant
	Montana	40	5/14				Roast beef/sauce	(D) Restaurant
	Montana	3	12/01				Unknown	(C) Home
	Montana	27	12/15				Pork	(B) Restaurant
	Nebraska	11	7/16				Unknown	(D) Restaurant
	Nebraska	95	9/27				Unknown	(D) Restaurant
	Nebraska	8	11/18				Unknown	(D) Clinic
	Nebraska	20	12/05	+			Unknown	(D) Home
	New Hampshire	19	7/22				Unknown	(D) Wedding
	New Jersey	8	1/27				Unknown	(B) Restaurant
	New Jersey	10	3/05			+	Unknown	(D) Home
	New Jersey	74	4/23	+			Unknown	(B) Police academy
	New Jersey	12	4/24				Beef	(D) Home
	New Jersey	26	5/07				Clams	(C) Home
	New Jersey	900	5/20				Unknown	(B) Church
	New Jersey	47	6/12				Unknown	(B) Restaurant
	New Jersey	26	12/16				Unknown	(D) Restaurant
	New Mexico	4	6/29				Unknown	(C) Home
	New Mexico	2	8/26				Unknown	(C) Home
	New Mexico	2	11/08				Unknown	(B) Restaurant
	New Mexico	2	?/?				Unknown	(D) Unknown
	New Mexico	2	?/?				Unknown	(D) Restaurant

	New Mexico	2	?/?				Unknown	(D) Other
	New Mexico	2	?/?				Unknown	(D) Home
	New Mexico	19	?/?				Beef	(D) Restaurant
	New Mexico	50	?/?				Other, not spec	(D) School
	New Mexico	3	?/?				Chicken	(D) Restaurant
	New Mexico	5	?/?				Unspecified diary	(D) Restaurant
	New Mexico	4	?/?				Chicken	(D) Home
	New Mexico	2	?/?				Chicken	(D) Home
	New Mexico	3	?/?				Unknown	(D) Restaurant
	New Mexico	4	?/?				Unspec salads/sauce	(D) Restaurant
	New Mexico	2	?/?				Chicken salad	(D) Restaurant
	New York	18	8/14				Ham	(D) Home
	North Carolina	8	4/18				Unknown	(D) Showroom
	Oklahoma	40	?/?				Unknown	(D) Other
	Oregon	7	3/27				Unknown	(D) Restaurant
	Oregon	17	6/11				Unknown	(D) Other
	Oregon	27	7/22				Unknown	(D) Camp
	Oregon	14	8/03				Unknown	(D) Home
	Oregon	5	8/30		+		Mexican food	(B) Restaurant
	Pennsylvania	4	1/18				Unknown	(D) Home
	Pennsylvania	3	3/23				Unknown	(D) Pizzeria
	Pennsylvania	2	4/01				Unknown	(D) Unknown
	Pennsylvania	15	4/03				Unknown	(D) Private club
	Pennsylvania	19	4/30				Shrimp	(D) Restaurant

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Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
UNKNOWN	Pennsylvania	4	5/01				Pizza	(D) Home
	Pennsylvania	2	5/19				Unknown	(D) Restaurant
	Pennsylvania	3	5/20				Unknown	(D) Restaurant
	Pennsylvania	83	5/26				Unknown	(B) Camp
	Pennsylvania	34	6/05				Cake	(D) Picnic
	Pennsylvania	9	6/18				Unknown	(B) Camp
	Pennsylvania	61	7/20				Egg salad	(D) Other
	Pennsylvania	4	7/22				Unknown	(D) Home
	Pennsylvania	6	7/30				Unknown	(D) Home
	Pennsylvania	25	10/24				Unknown	(B) Cafeteria
	Pennsylvania	5	11/16				Unknown	(B) Home
	Pennsylvania	15	12/04				Unknown	(D) Banquet hall
	Rhode Island	80	1/05				Turkey & gravy	(D) School
	South Carolina	3	6/19				Unknown	(B) Break room
	South Dakota	16	5/22				Unknown	(D) Mil. kitchen
	Texas	45	5/05				Unknown	(D) School
	Vermont	44	2/05				Unknown	(D) Restaurant
	Virginia	3	3/?				Unknown	(D) Office
	Virginia	18	4/16		+		Beef	(D) Fast food
	Virginia	50	5/16				Unknown	(B) Restaurant
	Virginia	10	10/13				Unknown	(B) Office
	Washington	3	1/29				Unknown	(B) Restaurant
	Washington	3	2/02				Unknown	(D) Restaurant
	Washington	2	2/05				Unknown	(B) Restaurant

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
	Washington	2	2/07				Unknown	(B) Restaurant
	Washington	2	3/05				Unknown	(D) Restaurant
	Washington	53	3/17		+		Unknown	(B) Sr citizen ctr
	Washington	5	3/23				Unknown	(B) Restaurant
	Washington	2	3/23				Unknown	(B) Restaurant
	Washington	10	4/04				Unknown	(B) Restaurant
	Washington	2	4/06				Unknown	(B) Restaurant
	Washington	2	4/07				Unknown	(B) Restaurant
	Washington	2	4/16	+			Unknown	(B) Restaurant
	Washington	4	4/23				Unknown	(B) Restaurant
	Washington	3	4/23				Unknown	(D) Home
	Washington	2	5/02				Unknown	(D) Home
	Washington	2	5/06				Unknown	(B) Restaurant
	Washington	3	6/01				Unknown	(B) Restaurant
	Washington	2	6/01				Unknown	(D) Restaurant
	Washington	3	6/12				Unknown	(B) Restaurant
	Washington	14	6/14				Unknown	(B) Restaurant
	Washington	2	6/18				Unknown	(B) Restaurant
	Washington	6	6/20				Unknown	(D) Restaurant
	Washington	4	7/07				Fried rice	(B) Restaurant
	Washington	3	7/11				Unknown	(B) Restaurant
	Washington	2	7/13	+			Unknown	(B) Restaurant
	Washington	4	7/15				Unknown	(B) Restaurant
	Washington	2	7/29				Chinese food	(B) Restaurant

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Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
UNKNOWN	Washington	5	8/05				Unknown	(C) Home
	Washington	2	8/22				Unknown	(D) Restaurant
	Washington	21	9/07				Unknown	(C) School
	Washington	2	9/18				Unknown	(D) Restaurant
	Washington	2	9/24				Unknown	(D) Restaurant
	Washington	2	9/25				Unknown	(B) Restaurant
	Washington	6	11/09				Unknown	(D) Home
	Washington	4	11/09				Unknown	(D) Home
	Washington	3	11/14				Unknown	(B) Restaurant
	Washington	4	11/24				Unknown	(B) Restaurant
	Washington	2	11/27				Unknown	(D) Restaurant
	Washington	2	12/03				Unknown	(C) Home
	Washington	22	12/10				Unknown	(D) Restaurant
	Washington	54	12/13				Unknown	(B) Cafeteria
	Wisconsin	4	2/14				Unknown	(C) Home
	Wisconsin	51	12/09				Unknown	(D) Restaurant
	Guam	10	5/06	+			Shellfish	(C) Home
	Guam	23	12/09				Unknown	(B) Prison
	New York City	2	1/07				Unknown	(D) Restaurant
	New York City	2	1/07				Unknown	(D) Restaurant
	New York City	3	1/10				Unknown	(D) Other
	New York City	4	1/14				Unknown	(D) Restaurant
	New York City	2	1/16				Unknown	(D) Restaurant
	New York City	2	1/20				Unknown	(D) Other

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
	New York City	2	1/21				Unknown	(D) Restaurant
	New York City	67	1/22				Unknown	(D) Other
	New York City	4	1/22				Unknown	(D) Restaurant
	New York City	3	1/22				Unknown	(D) Restaurant
	New York City	2	1/25				Unknown	(D) Restaurant
	New York City	4	1/25				Unknown	(D) Other
	New York City	2	1/26				Unknown	(D) Restaurant
	New York City	8	1/27				Unknown	(D) Restaurant
	New York City	3	1/27				Unknown	(D) Home
	New York City	3	1/31				Unknown	(D) Restaurant
	New York City	2	2/02				Unknown	(D) Restaurant
	New York City	3	2/02				Unknown	(D) Other
	New York City	3	2/04				Unknown	(D) Home
	New York City	2	2/05				Unknown	(D) Restaurant
	New York City	2	2/05				Unknown	(D) Restaurant
	New York City	3	2/07				Unknown	(D) Restaurant
	New York City	2	2/25				Unknown	(D) Restaurant
	New York City	3	2/26				Unknown	(D) Restaurant
	New York City	2	2/26				Unknown	(D) Restaurant
	New York City	2	2/28				Unknown	(D) Restaurant
	New York City	4	2/?		+		Unknown	(D) Restaurant
	New York City	3	3/01		+		Unknown	(D) Home
	New York City	3	3/10				Unknown	(D) Restaurant
	New York City	2	3/11				Unknown	(D) Restaurant

*(A)—Food processing establishment; (B)—Food service establishment; (C)—Home; (D)—Unknown; (E)—Not applicable

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
UNKNOWN	New York City	2	3/14				Unknown	(D) Restaurant
	New York City	2	3/14				Unknown	(D) Home
	New York City	4	3/18				Unknown	(D) Restaurant
	New York City	3	3/19				Unknown	(D) Restaurant
	New York City	2	3/20				Unknown	(D) Restaurant
	New York City	2	3/26				Unknown	(D) Restaurant
	New York City	4	4/02				Unknown	(D) Restaurant
	New York City	2	4/04				Unknown	(D) Restaurant
	New York City	2	4/08				Unknown	(D) Restaurant
	New York City	2	4/09				Unknown	(D) Restaurant
	New York City	2	4/09				Unknown	(D) Restaurant
	New York City	2	4/10				Unknown	(D) Restaurant
	New York City	7	4/13				Unknown	(D) Home
	New York City	3	4/18				Unknown	(D) Restaurant
	New York City	4	4/20				Unknown	(D) Other
	New York City	2	4/23				Unknown	(D) Restaurant
	New York City	5	5/02				Unknown	(D) Restaurant
	New York City	3	5/03				Unknown	(D) Home
	New York City	2	5/08				Unknown	(D) Restaurant
	New York City	2	5/09				Unknown	(D) Restaurant
	New York City	2	5/11				Unknown	(D) Restaurant
	New York City	2	5/21				Unknown	(D) Restaurant
	New York City	35	5/22				Unknown	(D) Other
	New York City	3	5/27				Unknown	(D) Restaurant

	New York City	2	5/31				Unknown	(D) School
	New York City	5	6/01				Unknown	(D) Restaurant
	New York City	36	6/04				Unknown	(D) Restaurant
	New York City	2	6/07				Unknown	(D) Restaurant
	New York City	4	6/08				Unknown	(D) Restaurant
	New York City	35	6/11				Unknown	(D) Home
	New York City	3	6/13				Unknown	(D) Restaurant
	New York City	30	6/22				Unknown	(B) Restaurant
	New York City	9	6/22				Unknown	(B) Other
	New York City	2	6/27				Unknown	(B) Restaurant
	New York City	2	6/28				Unknown	(D) Restaurant
	New York City	2	7/11				Unknown	(D) Restaurant
	New York City	2	7/12				Unknown	(B) Restaurant
	New York City	2	7/12				Unknown	(D) Restaurant
	New York City	2	7/22				Unknown	(D) Restaurant
	New York City	4	8/07				Unknown	(D) Restaurant
	New York City	2	8/12				Unknown	(D) Restaurant
	New York City	3	8/28				Unknown	(D) Restaurant
	New York City	2	9/05				Unknown	(D) Restaurant
	New York City	2	9/16				Unknown	(D) Restaurant
	New York City	2	9/17				Unknown	(D) Restaurant
	New York City	2	9/19				Unknown	(D) Home
	New York City	2	9/22				Unknown	(D) Restaurant
	New York City	5	9/26				Unknown	(D) Restaurant

*(A)--Food processing establishment; (B)--Food service establishment; (C)--Home; (D)--Unknown; (E)--Not applicable

Etiology	State	Number of Cases	Date of Onset	Lab Data: Patient	Lab Data: Vehicle	Lab Data: Food-Handler	Vehicle	Location Where Food Mishandled* and Eaten
UNKNOWN	New York City	4	9/26				Unknown	(D) Restaurant
	New York City	3	9/28				Unknown	(D) Restaurant
	New York City	2	9/29				Unknown	(D) Restaurant
	New York City	2	10/08				Unknown	(D) Restaurant
	New York City	2	10/11				Unknown	(D) Restaurant
	New York City	39	10/15				Unknown	(B) Restaurant
	New York City	3	10/15				Unknown	(D) Restaurant
	New York City	50	11/07				Unknown	(D) Other
	New York City	2	11/07				Unknown	(D) Other
	New York City	3	11/07				Unknown	(D) Other
	New York City	3	11/09				Unknown	(D) Restaurant
	New York City	2	11/11				Unknown	(D) Restaurant
	New York City	2	11/14				Unknown	(D) Restaurant
	New York City	3	11/19				Unknown	(D) Other
	New York City	2	11/20				Unknown	(D) Restaurant
	New York City	2	11/26				Unknown	(D) Restaurant
	New York City	2	11/26				Unknown	(D) Restaurant
	New York City	2	11/29				Unknown	(D) Restaurant
	New York City	2	11/30				Unknown	(D) Restaurant
	New York City	2	12/02				Unknown	(D) Restaurant
	New York City	12	12/02				Unknown	(D) Home
	New York City	2	12/07				Unknown	(D) Restaurant
	New York City	25	12/09				Unknown	(D) Restaurant
	New York City	2	12/11				Unknown	(D) Restaurant

	New York City	3	12/11				Unknown	(D) Restaurant
	New York City	2	12/15				Unknown	(D) Restaurant
	New York City	2	12/20				Unknown	(D) Other
	New York City	4	12/20				Unknown	(D) Restaurant
	New York City	2	12/30				Unknown	(D) Restaurant
	New York City	12	?/?				Unknown	(B) Other
	New York City	20	?/?				Unknown	(D) School
	New York City	2	?/?				Unknown	(D) Restaurant
	New York City	2	?/?				Unknown	(D) Restaurant

*(A)--Food processing establishment; (B)--Food service establishment; (C)--Home; (D)--Unknown; (E)--Not applicable

G. Guidelines for Confirmation of Foodborne Disease Outbreak

BACTERIAL	Clinical Syndrome	Laboratory and/or Epidemiologic Criteria
1. Bacillus cereus	a) incubation period 2-16 hrs. b) gastrointestinal syndrome	a) isolation of $\geq 10^5$ organisms per gram in epidemiologically incriminated food OR b) isolation of organism from stools of ill person.
2. Brucella	a) incubation period several days to several months b) clinical syndrome compatible with brucellosis	a) 4-fold increase in titer OR b) positive blood culture
3. Clostridium botulinum	a) incubation 2 hours-8days, usually 12-48 hours b) clinical syndrome compatible with botulism (see CDC Botulism Manual)	a) detection of botulinal toxin in human sera, feces, or food OR b) isolation of C. botulinum organism from epidemiologically incriminated food or stools OR c) food epidemiologically incriminated
4. Clostridium perfringens	a) incubation period 9-15 hrs. b) lower intestinal syndrome--majority of cases with diarrhea but little vomiting or fever	a) organisms of same serotype in epidemiologically incriminated food and stool of ill individuals. OR b) isolation of organisms with same serotype in stool of most ill individuals and not in stool of controls OR c) $\geq 10^5$ organisms per gram in epidemiologically incriminated food provided specimen properly handled
5. Escherichia coli	a) incubation period 6-36 hrs. b) gastrointestinal syndrome--majority of cases with diarrhea	a) demonstration of organisms of same serotype in epidemiologically incriminated food and stool of ill individuals and not in stool of controls OR b) isolation from stool of most ill individuals, organisms of the same serotype which have been shown to be enterotoxigenic or invasive by special laboratory techniques
6. Salmonella	a) incubation period 6-48 hrs. b) gastrointestinal syndrome--majority of cases with diarrhea	.2) isolation of Salmonella organism from epidemiologically implicated food OR b) isolation of Salmonella organism from stools of ill individuals

	Clinical Syndrome	Laboratory and/or Epidemiologic Criteria
7. Shigella	a) incubation period 12-50 hours b) gastrointestinal syndrome--majority of cases with diarrhea	a) isolation of Shigella organism from epidemiologically implicated food OR b) isolation of Shigella organism from stools of ill individuals
8. Staphylococcus aureus	a) incubation period 30 min.-8 hours (usually 2-4 hrs.) b) gastrointestinal syndrome--majority of cases with vomiting	a) detection of enterotoxin in epidemiologically implicated food OR b) organisms with same phage type in stools or vomitus of ill individuals and, when possible, implicated food and/or skin or nose of food handler OR c) isolation of $\geq 10^5$ organisms per gram in epidemiologically implicated food
9. Streptococcus Group A	a) incubation period 1-4 days b) febrile URI snydrome	a) isolation of organisms with same M and T type from implicated food OR b) isolation of organisms with same M and T type from throats of ill individuals
10. Vibrio cholerae	a) incubation period 1-3 days b) gastrointestinal syndrome--majority of cases with diarrhea and without fever	a) isolation of V. cholerae from epidemiologically incriminated food OR b) isolation of organisms from stools or vomitus of ill individuals OR c) significant rise in vibriocidal, bacterial agglutinating or antitoxin antibodies in acute and early convalescent sera, or significant fall in vibriocidal antibodies in early and late convalescent sera in persons not recently immunized
11. Vibrio parahaemolyticus	a) incubation period 15-24 hrs. b) gastrointestinal syndrome--majority of cases with diarrhea	a) isolation of $\geq 10^5$ organisms from epidemiologically implicated food (usually seafood) OR b) isolation of Kanagawa-positive organisms of same serotype from stool of ill individuals
12. Others	clinical data appraised in individual circumstances	laboratory data appraised in individual circumstances

	Clinical Syndrome	Laboratory and/or Epidemiologic Criteria
CHEMICAL		
1. Heavy metals Antimony Cadmium Copper Iron Tin Zinc, etc	a) incubation period 5 min. to 8 hrs. (usually less than 1 hr) b) clinical syndrome compatible with heavy metal poisoning--usually gastrointestinal syndrome and often metallic taste	demonstration of high concentration of metallic ion in epidemiologically incriminated food or beverage
2. Ichthyosarcotoxin		
Ciguatoxin	a) incubation period 1-36 hrs. (usually 2-8 hrs.) b) clinical syndrome compatible with ciguatera--usually initial gastrointestinal symptoms followed by dry mouth, paresthesia of lips, tongue, throat or extremities. A sensation of looseness and pain in the teeth and and a paradoxical temperature sensation are characteristic	a) demonstration of ciguatoxin in epidemiologically incriminated fish OR b) ciguatera-associated fish epidemiologically incriminated
Puffer fish (tetrodotoxin)	a) incubation period 10 min. to 3 hrs. (usually 10-45 min.) b) clinical syndrome compatible with puffer fish poisoning--paresthesia of lips, tongue, face or extremities often followed by numbness, loss of proprioception or a "floating" sensation	a) demonstration of tetrodotoxin in fish OR b) puffer fish epidemiologically incriminated
Scombrotoxin	a) incubation period 1 min. to 3 hours (usually less than 1 hour) b) clinical syndrome compatible with scombroid fish poisoning often including flushing, headache, dizziness, burning of mouth and throat, upper and lower gastrointestinal symptoms, urticaria and generalized pruritus	a) demonstration of elevated histamine levels in epidemiologically incriminated fish OR b) fish of order Scombrodei or fish associated with scombroid poisoning (e.g., mahi-mahi) epidemiologically incriminated

	Clinical Syndrome	Laboratory and/or Epidemiologic Criteria
3. Monosodium glutamate	a) incubation period 3 min. to 2 hours (usually less than 1 hour) b) clinical syndrome compatible with monosodium glutamate intoxication--often including burning sensations in chest, neck, abdomen or extremities, sensations of lightness and pressure over face, or a heavy feeling in the chest	history of large amounts (usually ≥1.5 grams) of MSG having been added to epidemiologically incriminated food
4. Mushroom poison		
Group containing ibotenic acid and muscimol	a) incubation period 1-12 hrs. (usually less than 4 hrs.) b) clinical syndrome compatible with mushroom poisoning by this group--often including confusion, delirium, visual disturbances	a) demonstration of toxic chemical in epidemiologically incriminated mushrooms OR b) epidemiologically incriminated mushrooms identified as a toxic type
Group containing amanitotoxins and phallotoxins, or gyromitrin	a) incubation period 5-18 hrs. b) characteristic clinical syndrome compatible with mushroom poisoning by this group--upper and lower gastrointestinal symptoms followed by hepatic and/or renal failure	a) demonstration of toxic chemical in epidemiologically incriminated mushrooms OR b) epidemiologically incriminated mushrooms identified as a toxic type
Groups containing muscarine, psilocybin and psilocin, gastrointestinal irritants, disulfiram-like compounds	a) characteristic incubation period b) clinical syndrome compatible with mushroom poisoning by these groups	a) demonstration of toxic chemical in epidemiologically incriminated mushrooms OR b) epidemiologically incriminated mushroom identified as toxic type
5. Paralytic and neurotoxic shellfish poison	a) incubation period 30 min. to 3 hours b) clinical syundrome compatible with paralytic shellfish poisoning--often including paresthesia of lips, mouth or face and often upper and lower gastrointestinal symptoms	a) detection of toxin in epidemiologically incriminated mollusks OR b) detection of large numbers of shellfish poisoning-associated species of dinoflagellates in water from which epidemiologically incriminated mollusks gathered
6. Other chemical	clinical data appraised in individual circumstances	laboratory data appraised in individual circumstances
PARASITIC AND VIRAL		
1. *Trichinella spiralis*	a) incubation period 3-30 days	a) muscle biopsy from ill individual

	Clinical Syndrome	Laboratory and/or Epidemiologic Criteria
	b) clinical syndrome compatible with trichinosis--often including fever, high eosinophil count, orbital edema, myalgia	OR b) serological tests OR c) demonstration of larvae in incriminated food
2. Hepatitis A	a) incubation period 10-45 days b) clinical syndrome compatible with hepatitis--usually including jaundice, GI symptoms, dark urine	liver function tests compatible with hepatitis in affected persons who consumed the epidemiologically incriminated food
3. Others	clinical evidence appraised in individual circumstances	laboratory evidence appraised in individual circumstances

H. Selected Foodborne Outbreak Articles, Taken from Morbidity and Mortality Weekly Report

Clostridium perfringens Food Poisoning--California
(MMWR 27(19):164-165, 1978)

An outbreak of *Clostridium perfringens* food poisoning in Ojai, California, traced to the consumption of bean-filled burritos,* illustrates that foods other than meat, poultry, or gravy contain the essential amino acids to support growth of this organism.

The burritos that caused the outbreak were one of many Mexican-style foods offered for sale at an outdoor fund-raising event on September 18, 1977, in Ojai. On September 19, the Ventura County Environmental Health Division began receiving reports of illness and initiated an investigation. To identify cases, hospital and community doctors, school nurses, and the event-organizers were contacted, and press releases were distributed to the local media. By these means, 181 ill persons who had attended the event were identified. Information about 40 other persons who ate at the event but did not become ill was also obtained. It is not known how many persons consumed burritos at this event, although sales receipts showed that about 1,200 had been sold.

Symptoms consisted primarily of diarrhea (96.2%) and cramps (79.7%). Only 3 (1.7%) of those ill reported vomiting. The mean incubation period was 11 hours, with 87% of persons reporting illness from 8-22 hours after eating. The majority of ill persons were free of symptoms within 24 hours of onset. No one was hospitalized. Analysis of food histories incriminated the bean-filled burritos ($p<.01$).

Containers of leftover bean-burrito filling, green chili sauce, taco sauce, and shredded longhorn cheese refrigerated at 5°C (40°F) were sampled by county investigators 3 hours after closing of the food stand. Samples of 1 frozen burrito, another held at room temperature, and a frozen enchilada were also obtained. All of the food samples were examined for the presence of *Salmonella*, *Shigella*, *Staphylococcus*, and *C. perfringens* and for total aerobic colony counts. The bean-burrito filling and the unrefrigerated whole burrito were found to contain 4.0×10^6 and 7.1×10^6 *C. perfringens* bacteria per gram, respectively. None of the other food specimens contained more than 30,000 *C. perfringens* organisms per gram. No *Shigella*, *Salmonella*, or *Staphylococcus* organisms were found in food specimens.

The bean-burrito filling contained no meat or meat extracts. It was prepared from dried pinto beans that had been boiled with water in metal pots, mashed, and stored in cafeteria refrigerators overnight. The pots of beans were kept refrigerated while they were being transported the following morning. They were transferred to smaller open containers and reheated for an undetermined period of time before being served in the burritos. Several persons throughout the day reported that the beans were not heated and the burritos were served at ambient temperature. During that day, shade temperatures reched 29.4°C (85°F). There was no evidence of cross contamination with meat products.

Editorial Note: Pinto beans and other legumes provide an excellent substrate for *C. perfringens* (1). If beans are not served immediately after cooking, they should be held at ≥60°C (140°F) or rapidly cooled in shallow containers in refrigerators and reheated to 74°C (165°F) before being served.

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*burrito: a flour tortilla filled with either meat or beans and generally garnished with hot sauce and cheese

Restaurant Outbreak of Salmonellosis Due to Undercooked Turkey--Washington
(MMWR 27(51):514, 515, 1978)

During October an outbreak of febrile gastroenteritis due to Salmonella muenster, involving 19 persons, occurred in King County, Washington. Investigation traced the illness to turkey prepared at a local restaurant.

An epidemiologic investigation was initiated on October 9, when individuals representing 3 separate groups telephoned complaints of food poisoning to the county health department. Investigation and reports by physicians identified a total of 19 patients. Eighteen of these persons had eaten at 1 restaurant at different times during October 3-5, 1978; the other patient was a cook at the restaurant.

The symptoms of the 18 diners were diarrhea (100%), abdominal cramps (100%), fever (67%), and vomiting (44%) 8 to 39 hours (mean, 17 hours) after eating. The duration of illness ranged from 1 to 17 days (mean, 3 days). S. muenster was isolated from 10 stool specimens submitted by 11 of the 18 symptomatic patients, from 1 of 2 specimens submitted by asymptomatic customers, and from the cook who had had diarrheal illness during the same 3-day period.

Food histories of the 18 customers and of 9 other restaurant patrons showed that all 18 ill diners but only 2 of 8 well customers had eaten cold turkey in either cold sandwiches or turkey salad ($p=.0012$). Investigation revealed that all turkey served in the restaurant was cooked on the premises by roasting to an internal meat temperature of 135-140°F (57-60°C), rather than the 165°F (74°C) required by Washington state regulations. Cooked turkeys were then refrigerated until served in sandwiches or salad. Hot turkey dishes were prepared by reheating sliced meat to a temperature over 164°F (74°C). No food specimens served during the implicated period were available for culture; a specimen of turkey obtained a week after the outbreak was culture-negative for salmonellae, as were several environmental cultures.

The restaurant complied promptly with all regulations; subsequently, no further cases have been reported.

Editorial Note: This outbreak of S. muenster enteritis serves as a timely reminder of the need for proper cooking of poultry and other products to prevent salmonellosis. In this outbreak, reheating apparently provided sufficient additional cooking, since only cold turkey dishes were implicated. The cook, although he was culture-positive, was probably not the source of the outbreak. He ate at the restaurant and probably became infected there.

Botulism--Puerto Rico
(MMWR 27(38):356-357, 1978)

The first outbreak of botulism reported in Puerto Rico occurred in August 1978, among a restaurant owner and 2 of his employees in Guaynabo.

On August 10, a 46-year-old Guaynabo businessman presented to a hospital emergency room with vomiting, ptosis, and blurred vision. No sensory abnormalities were noted. Initial treatment included intravenous fluids and observation, but as dysphagia and dyspnea developed, a neurologist was consulted, and the clinical diagnosis of botulism was made. He was admitted to a medical center in San Juan, where he was placed on ventilatory assistance. He received 4 vials of trivalent (ABE) botulinal antitoxin within 24 hours without noticeable improvement. He died of pneumonia on August 12.

The Puerto Rico Department of Health was notified of the case on August 10 and began an investigation immediately. It was found that the patient's wife had prepared marinated fish on approximately July 26. She had stored it in 3 large, narrow-mouthed, glass jars, closed with screw caps, and left it to "cure" under a table in her husband's cafeteria-pizzeria business. When the investigators found the jars, a thick layer of oil had formed between the fish mixture and the air remaining in each jar. The jars was confiscated.

Attempts by investigators to find who else might have consumed the fish led to the identification of 2 more cases. The second patient was a 24-year-old restaurant employee who had developed weakness on August 4 after eating fish for 3 days. He had been hospitalized on August 8 with weakness, neck pain, and blurred vision. He never developed respiratory symptoms but had ptosis, shoulder and neck weakness, and dysphagia. By August 10, when the diagnosis of botulism was made, he was slightly improved and was not given antitoxin.

Another employee, a 16-year-old man, was absent from work on August 10. He was found at home in a remote rural community with severe weakness, ptosis, and dysarthria. He had eaten small amounts of fish on August 8 and 9. His therapy included ventilatory assistance and 4 vials of antitoxin. He developed pneumonia, and has improved slowly.

Two other employees and 3 additional people ate the fish between July 27 and August 8, but they remained well.

Serum was obtained from the patients on August 10, and type A botulinal toxin was present in patients 1 and 3. Stool, obtained only from the second patient, had no toxin. Culture results are pending. The contents of the 3 jars of marinated fish all had type A toxin; pH levels ranged from 3.9 to 4.9.

Editorial Note: Marinated fish is a very common food in Puerto Rico. Perhaps the most significant factor in toxin production in this case was the use of closed, narrow-mouthed jars rather than the customary practice of marinating fish in wide, shallow trays. The thick oil layer between the fish and the air may have protected the fish from the acid marinade while preventing passage of oxygen into the solution. Although the pH level of the food approximated the 4.5 value generally regarded as inhibitory to germination of Clostridium botulinum spores (1), the variation in pH levels in the layers present may have allowed for nonprotective regions.

Although type E toxin is commonly associated with outbreaks traced to fish, type A toxin is also frequently responsible (2,3).

Prompt notification of the Puerto Rico Health Department made possible the identification of cases 2 and 3, confiscation of the implicated food, and control of the outbreak.

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Follow-up on Vibrio cholerae Infection--Louisiana
(MMWR 27(39):367, 1978)

A fourth person clinically ill with cholera was identified in Louisiana. The patient, a 19-year-old woman who lives near Abbeville, had onset of diarrhea on September 18, 1978. She was hospitalized on September 21, treated with tetracycline, and recovered. Isolates from this case, the other 3 clinically ill persons, and 1 asymptomatic case were confirmed as Vibrio cholerae, biotype El Tor, serotype Inaba.

The 4 clinically ill persons had a history of ingesting steamed or boiled crab in the 2- to 5-day period before onset of illness; the asymptomatic case had also recently eaten such food. For each of the 4 ill persons, 2 matched controls were questioned about eating seafood. None of these 8 controls had recently eaten steamed or boiled crab. An isolate of V. cholerae, serotype Inaba, was made from a sample of shrimp collected in the area where crabs eaten by 1 patient were collected.

Editorial Note: These 5 persons come from 2 adjacent towns and had no single common contact or water supply. The seafoods eaten by these persons came from different locations along 60 miles of the Louisiana Gulf Coast. If the steamed crabs were a vehicle, they were insufficiently cooked to destroy V. cholerae organisms or they were recontaminated after cooking. Residents of the area were warned to take extra care with the preparation of crabs to insure that they were adequately cooked and not subsequently contaminated.

Since the United States will now be listed by the World Health Organization as having a cholera-infected area, the following countries will now require International Certificates of Vaccination against Cholera from travelers arriving from Vermilion Parish, Louisiana: Albania, Angola, Brunei, Cape Verde, China (People's Republic), China (Republic of), Egypt, Fiji, Iran, Iraq, Lao People's Democratic Republic, Libyan Arab Jamahiriya, Madagascar, Mali, Nauru, Pakistan, Panama, Pitcairn Island, Oatar, Ryukyu Islands, Saint Helena, Seychelles, Swaziland, Yemen, and Zambia. Five countries that always require cholera vaccination from all travelers are Malawi, Maldives, Mozambique, Papua New Guinea, and Saudi Arabia. The following countries will require a Certificate only from travelers proceeding to a country with a cholera requirement: Burma, India, and Nigeria.

An area is considered infected until 10 days has passed "since the last case identified has died, recovered, or been isolated, and there is no epidemiological evidence of spread of that disease to any contiguous area" (1).

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