Annex 6
Investigation report forms

Outline of an outbreak investigation report

Cover page

- Title of report
  Indicate whether this is a preliminary or a final report. Keep the title short and memorable, but include information on the type of problem under investigation, the location and date.
- Date of report
- Names and affiliations of the main authors and investigators

Abstract
The abstract should be written after the report has been completed. It should stand alone and contain the most relevant data and conclusions. All data mentioned in the abstract must also appear in the main section of the report. Sentences from the Discussion section can be used verbatim in the abstract.

Report

- Introduction
  Statement of the problem and its public health importance.
  Details and time frame regarding initial source of information.
  Reasons for investigating event.
  Type of investigations conducted and agencies involved.
- Background
  Generally available information to help the reader interpret epidemiology and data presented in the report (e.g. population size, socioeconomic status of community, ethnicity, etc.).
  If outbreak occurred in a food premises, description of premises (e.g. size of restaurant, usual practices and operations, etc.).
  Description of the problem.
  Sequence of events leading to the study or investigation.
  Brief statement of the working hypothesis.
- Objectives
  Specify targets to be achieved by the investigations.
  Keep objectives concise and follow a logical, sequential pattern.
  The objectives may include hypotheses, if any, to be tested.
• **Methods**

  **Epidemiology:**
  - description of study population
  - type of study conducted
  - case definition
  - procedures for case-ascertainment and selection of controls (if any)
  - methods of data collection, including questionnaire design, administration and contents
  - methods of data analysis.

  **Medical laboratory testing:**
  - methods of specimen collection and processing
  - name of laboratory carrying out tests
  - laboratory techniques employed and methods of data analysis.

  **Food and food testing:**
  - description of inspection process
  - methods of food and environmental sampling
  - name of laboratory carrying out tests
  - laboratory techniques employed and methods of data analysis.

• **Results**

  Present all pertinent results from clinical, laboratory, epidemiological and environmental findings.

  Present results in same order as described in the methods section.

  Do not interpret or discuss the data in this section.

  **Epidemiology:**
  - number of cases, overall attack rate
  - clinical details of illness (symptoms, duration, hospitalization, outcome, etc.)
  - descriptive epidemiology by time (epidemic curve), place and person (age, sex, race, specific characteristics) expressed as rates
  - risk factor exposures
  - further data analysis and data presentation depending on specific studies undertaken (e.g. cohort or case–control study).

  **Laboratory (microbiology, chemical, toxicological):**
  - number of specimens collected
  - findings by type of laboratory analysis.

  **Food investigation and food testing:**
  - findings of food inspections
  - results of laboratory tests performed on food and environmental samples.

• **Discussion**

  The discussion is the most important part of the report and should cover:
  - summary of the major findings
  - likely accuracy of the results
- conclusions with justification for those conclusion and rejection of alternative explanations
- relationship of these results to other studies and the literature
- implications of the findings
- an assessment of control measures
- needs for future research.

**Recommendations**
Initial recommendations and those for future prevention and control should be listed numerically.

**References**
Select appropriate references, including reviews in major scientific journals. Follow a standard style of referencing (e.g. Vancouver style), numbering the references in the order in which they appear in the text.

**Appendices**
Questionnaires and/or other survey forms
Appropriate field reports
Any other relevant documents, including press releases.
**Sample report forms from various agencies**

*Example of an outbreak report form used by the WHO Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe*

<table>
<thead>
<tr>
<th>Report of incident</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Country:</strong></td>
</tr>
<tr>
<td><strong>4. Place of incident:</strong></td>
</tr>
<tr>
<td>City/Town: _____________________</td>
</tr>
<tr>
<td><strong>5. Causative agent/type:</strong></td>
</tr>
<tr>
<td>Code: F F F F F F</td>
</tr>
<tr>
<td>Phagetype: □ □ □</td>
</tr>
<tr>
<td><strong>6. Number of persons:</strong></td>
</tr>
<tr>
<td>at risk _____</td>
</tr>
<tr>
<td><strong>by age groups:</strong></td>
</tr>
<tr>
<td>from 0 to 4 years</td>
</tr>
<tr>
<td>from 4 to 15 ears</td>
</tr>
<tr>
<td>from 15 to 60 years</td>
</tr>
<tr>
<td>over 60 years</td>
</tr>
<tr>
<td><strong>7. Symptoms:</strong></td>
</tr>
<tr>
<td>□ Nausea</td>
</tr>
<tr>
<td>□ Fever</td>
</tr>
<tr>
<td><strong>8. Date of onset of illness:</strong></td>
</tr>
<tr>
<td>first person: _ _ / _ _ / _ _ _ _</td>
</tr>
<tr>
<td><strong>9. Incubation time and duration of illness:</strong> (in hours): □ ?</td>
</tr>
<tr>
<td>Incubation time: shortest _____</td>
</tr>
<tr>
<td>Duration of illness: shortest _____</td>
</tr>
<tr>
<td><strong>10. Food/vehicle involved:</strong></td>
</tr>
<tr>
<td>Code: F F F F F F</td>
</tr>
<tr>
<td>Confirmation: Laboratory □</td>
</tr>
<tr>
<td>Commercial name of product: __________________________________________</td>
</tr>
<tr>
<td>Producer: __________________________________________</td>
</tr>
<tr>
<td><strong>11. Methods of marketing, processing, serving:</strong></td>
</tr>
<tr>
<td>Marketed: code □</td>
</tr>
<tr>
<td>Served and eaten: code □</td>
</tr>
</tbody>
</table>
12. Place where food was contaminated:
   Place: code □  Country: code □

13. Place and date where food was acquired and eaten:
   Date: _ _ / _ _ / _ _ _ _     Place: code □
   During transit:
   Means of transit: code □  from: code □  to: code □

14. Factors contributing to incident:
   (a) Code □□
   (b) Code □□
   Other

   Note: In case more than one factor contributed, list all that are applicable but code only the two major factors.

15. Results of lab. tests:
   Testing laboratory: ______________________________

<table>
<thead>
<tr>
<th>Specimens/samples</th>
<th>No. tested</th>
<th>Positive</th>
<th>Details/comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ill people*</td>
<td>_________</td>
<td>_________</td>
<td>__________________</td>
</tr>
<tr>
<td>Well people*</td>
<td>_________</td>
<td>_________</td>
<td>__________________</td>
</tr>
<tr>
<td>Food-handlers</td>
<td>_________</td>
<td>_________</td>
<td>__________________</td>
</tr>
<tr>
<td>Suspect food</td>
<td>_________</td>
<td>_________</td>
<td>__________________</td>
</tr>
<tr>
<td>Other foods</td>
<td>_________</td>
<td>_________</td>
<td>__________________</td>
</tr>
<tr>
<td>Environment</td>
<td>_________</td>
<td>_________</td>
<td>__________________</td>
</tr>
</tbody>
</table>

   * Clinical samples.
Example of an outbreak form used in England and Wales for investigation of general outbreaks of infectious intestinal diseases

OUTBREAK NO. 97....................

Name: ______________________ Address: __________________________________
Position: ____________________     __________________________________
Telephone: ___________________ LA:   DHA: ____________________________
Date: ________________________

1. **MODE OF TRANSMISSION** (tick one only)
   - Mainly person to person ☐
   - Mainly foodborne ☐
   - Equal or unknown proportion of foodborne and person to person ☐
   - Other ☐ Specify water, animal contact, etc. ____________________________
   - Unknown ☐

2. **PLACE WHERE OUTBREAK OCCURRED, or if foodborne where food was prepared or served.** Tick one only. If foodborne “PREPARED” takes precedence over “SERVED”, e.g. if food was prepared in a shop but served in a house, tick “Shop/retailer”, if food was prepared at a house and served elsewhere, tick “Private house”.
   (a) Private house ☐
   (b) House/guest house/residential pub ☐ Specify ____________________________
   (c) Restaurant/café ☐ Specify ethnicity _______________________________
   (d) Pub/bar ☐
   (e) Mobile retailer ☐ Specify market trader, chip van, etc. ______________
   (f) Armed services camp ☐ Specify army, navy, etc. _______________________
   (g) Canteen ☐ Specify work, college ________________________________
   (h) Shop/retailer ☐ Specify baker, butcher, etc. __________________________
   (i) Hospital ☐ Specify general, geriatric, EMI _____________________________
   (j) Residential institution ☐ Specify nursing/residential home ______________
   (k) School ☐ Specify nursery, junior, etc. ______________________________
   (l) Other ☐ Specify ________________________________

3. **NAME AND ADDRESS OF PLACE**
   _______________________________________________________________
   _______________________________________________________________
   Postcode (if known)___________

4. **WAS THE OUTBREAK AT A FUNCTION?** Yes ☐ No ☐ Date of function __/__/____

5. **WAS PATHOGEN/TOXIN IDENTIFIED?** Yes ☐ No ☐
   If YES give: Organism/toxin________________ Serotype____________ Phage type____
   If NO: Specify organism suspected_____________________________________

6. **LABORATORY where tests performed:** State first and reference labs, even if microbiology was negative
   ☐ First lab _______________________________ ☐ Reference lab
7. **TOTAL NUMBER AFFECTED** (diarrhoea and/or vomiting +/- any other symptom) _____

**TOTAL NUMBER AT RISK** _____

Number admitted to hospital _____ Number known to have died _____

8. **LABORATORY RESULTS**

<table>
<thead>
<tr>
<th>NUMBER OF PEOPLE</th>
<th>AFFECTED PEOPLE</th>
<th>WELL PEOPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TESTED</td>
<td>POSITIVE</td>
</tr>
</tbody>
</table>

8a. **HOSPITAL OR RESIDENTIAL OUTBREAKS**

ONLY categories (i) and (j) in question 2

Residential/patients

Staff

Total

8b. **ALL OTHER OUTBREAKS**

Non-food-handlers

Food handlers

Total

9. **DATE OF ONSET:**

First known __ / __ / _____ Last known __ / __ / _____

10. **SUSPECT FOOD VEHICLE ASSOCIATED WITH ILLNESS:** only list specific vehicle for which there is microbiological, statistical or other convincing association with illness.

<table>
<thead>
<tr>
<th>VEHICLE</th>
<th>EVIDENCE (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Microbiological</td>
</tr>
<tr>
<td></td>
<td>Statistical association</td>
</tr>
</tbody>
</table>

11. **FAULTS THOUGHT TO HAVE CONTRIBUTED TO OUTBREAK:**

Infected food-handler  □ Give details

Inadequate heat treatment  □ Give details

Cross contamination  □ Give details

Storage too long/too warm  □ Give details

Other  □ Give details

Environmental Health Department’s inspection rating of premises (if available) (A–F): _______
Investigation of a foodborne outbreak

This form is used to report foodborne disease outbreak investigations to CDC. It is also used to report *Salmonella enteritidis* and *E. coli* O157:H7 outbreak investigations involving any mode of transmission. A foodborne outbreak is defined as the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food in the United States. This form has 6 parts. Part 1 asks for the minimum or basic information needed and must be completed for the investigation to be counted in the CDC annual summary. Part 2 asks for additional information for any foodborne outbreak, while Parts 3–6 ask for information concerning specific vehicles or etiologies. Please complete as much of all parts as possible.

### Part 1: Basic information

1. **Report type**
   - A. Please check if this is a final report
   - B. Please check if data does not support a FOODBORNE outbreak

2. **Number of cases**
   - Lab-confirmed cases (A)
     - including secondary cases
   - Probable cases (B)
     - including secondary cases
   - Estimated total ill
     - (if greater than sum A + B)

3. **Dates**
   - Date first case became ill
     - Month _/_ Day Year
   - Date last case became ill
     - Month _/_ Day Year
   - Date first known exposure
     - Month _/_ Day Year
   - Date last known exposure
     - Month _/_ Day Year

4. **Location of exposure**
   - Reporting state
   - If multiple states involved:
     - Exposure occurred in multiple states
     - Exposure occurred in single state, but cases resided in multiple states
     - Other states:
   - Reporting county
   - If multiple counties involved:
     - Exposure occurred in multiple counties
     - Exposure occurred in one county, but cases resided in multiple counties
     - Other counties:

5. **Approximate percentage of cases in each age group**
   - <1 year ______%
   - 1–4 yrs ______%
   - 5–19 yrs ______%
   - Unknown ______%

6. **Sex**
   - Male ______%
   - Female ______%

7. **Investigation methods**
   - Interviews of only cases
   - Environment / food sample cultures
   - Food preparation review
   - Food product traceback
   - Case–control study
   - Investigation at factory or production plant
   - Cohort study
   - Investigation at original source (farm, marine estuary, etc.)

8. **Implicated food(s)**
   - (please provide known information)

<table>
<thead>
<tr>
<th>Name of food</th>
<th>Main ingredient(s)</th>
<th>Contaminated ingredient(s)</th>
<th>Reason(s) suspected</th>
<th>Method of preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. lasagne</td>
<td>e.g. pasta, sauce, eggs, beef</td>
<td>e.g. eggs</td>
<td>(see codes just below) e.g. 4</td>
<td>(see attached codes) e.g. M1</td>
</tr>
<tr>
<td>1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Food vehicle undetermined

**Reason suspected** (list above all that apply)

1. Statistical evidence from epidemiological investigation
2. Laboratory evidence (e.g. identification of agent in food)
3. Compelling supportive information
4. Other data (e.g. same phage type found on farm that supplied eggs)
5. Specific evidence lacking but prior experience makes it likely source
### 9. Etiology
(Name the bacteria, virus, parasite, or toxin. If available, include the serotype and other characteristics such as phage type, virulence factors, and metabolic profile. Confirmation criteria available at http://www.cdc.gov/ncidod/dbmd/outbreak/ or MMWR2000/Vol. 49/SS-1/App. B)

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Serotype</th>
<th>Other characteristics (e.g., phage type)</th>
<th>Detected in (see codes just below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Etiology undetermined

Detected in (list all above that apply)
- 1. Patient specimen(s)
- 2. Food specimen(s)
- 3. Environment specimen(s)
- 4. Food worker specimen(s)

### 10. Isolate subtype

<table>
<thead>
<tr>
<th>Isolate subtype</th>
<th>State Lab. ID</th>
<th>PFGE (PulseNet designation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 11. Contributing factors
(check all that apply: see attached codes and explanations)

- Contributing factors unknown
- Contamination factor
  - C1
  - C2
  - C3
  - C4
  - C5
  - C6
  - C7
  - C8
  - C9
  - C10
  - C11
  - C12
  - C13
  - C14
  - C15 (describe in Comments) [ ] N/A
- Proliferation/amplification factor (bacterial outbreaks only)
  - P1
  - P2
  - P3
  - P4
  - P5
  - P6
  - P7
  - P8
  - P9
  - P10
  - P11
  - P12 (describe in Comments) [ ] N/A
- Survival factor (microbial outbreaks only)
  - S1
  - S2
  - S3
  - S4
  - S5 (describe in Comments) [ ] N/A

Was food-worker implicated as the source of contamination? [ ] Yes [ ] No
If yes, please check only one of following:
- laboratory and epidemiologic evidence
- epidemiologic evidence (w/o lab confirmation)
- lab evidence (w/o epidemiologic evidence)
- prior experience makes this the likely source (please explain in Comments) [ ]

### Part 2: Additional information

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cases with outcome/feature</th>
<th>Total cases for whom you have information available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare provider visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrhoea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloody stools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdominal cramps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUS or TTP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asymptomatic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 12. Symptoms, signs and outcomes

- Use the following terms, if appropriate, to describe other common characteristics of cases:
  - Anaphylaxis
  - Headache
  - Tachycardia
  - Arthralgia
  - Hypotension
  - Temperature reversal
  - Bradycardia
  - Itching
  - Thrombocytopenia
  - Bullous skin lesions
  - Jaundice
  - Urticaria
  - Coma
  - Lethargy
  - Wheezing
  - Cough
  - Myalgia
  - Descending paralysis
  - Paraesthesia
  - Diplopia
  - Seppicaemia
  - Flushing
  - Sore throat

### 13. Incubation period
(circle appropriate units)
- Shortest ______(hours, days)
- Longest ______(hours, days)
- Median ______(hours, days)

- Unknown

### 14. Duration of Illness
(among those who recovered)
(circle appropriate units)
- Shortest ______(hours, days)
- Longest ______(hours, days)
- Median ______(hours, days)

- Unknown
15. If cohort investigation conducted:

\[
\text{Attack rate} = \frac{\text{Exposed and ill}}{\text{Total number exposed for whom you have illness information}} \times 100 = \% \\
\]

* The attack rate is applied to persons in a cohort who were exposed to the implicated vehicle. The numerator is the number of persons who were exposed and became ill; the denominator is the total number of persons exposed to the implicated vehicle. If the vehicle is unknown, then the attack rate should not be calculated.

16. Location where food was prepared

<table>
<thead>
<tr>
<th>Food Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurant or deli</td>
</tr>
<tr>
<td>Day care center</td>
</tr>
<tr>
<td>School</td>
</tr>
<tr>
<td>Office setting</td>
</tr>
<tr>
<td>Workplace cafeteria</td>
</tr>
<tr>
<td>Banquet facility</td>
</tr>
<tr>
<td>Picnic</td>
</tr>
<tr>
<td>Caterer</td>
</tr>
<tr>
<td>Grocery store</td>
</tr>
<tr>
<td>Fair, festival, other temporary/ mobile services</td>
</tr>
<tr>
<td>Commercial product, served without further preparation</td>
</tr>
<tr>
<td>Unknown or undetermined</td>
</tr>
<tr>
<td>Other (describe)</td>
</tr>
</tbody>
</table>

17. Location of exposure or where food was eaten

<table>
<thead>
<tr>
<th>Food Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurant or deli</td>
</tr>
<tr>
<td>Day care center</td>
</tr>
<tr>
<td>School</td>
</tr>
<tr>
<td>Office setting</td>
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<td>Workplace cafeteria</td>
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<tr>
<td>Banquet facility</td>
</tr>
<tr>
<td>Picnic</td>
</tr>
<tr>
<td>Grocery store</td>
</tr>
<tr>
<td>Fair, festival, temporary/ mobile service</td>
</tr>
<tr>
<td>Unknown or undetermined</td>
</tr>
<tr>
<td>Other (describe)</td>
</tr>
</tbody>
</table>

18. Trace back

| Source to which trace back led:             |

19. Recall

| Recall comments                             |

20. Available reports (please attach)

<table>
<thead>
<tr>
<th>Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpublished agency report</td>
</tr>
<tr>
<td>Epi-Aid report</td>
</tr>
<tr>
<td>Publication (please reference if not attached)</td>
</tr>
</tbody>
</table>

21. Agency reporting this outbreak

| Agency reporting this outbreak               |

22. Remarks

| Remarks                                      |

Foodborne Disease Outbreaks. Guidelines for Investigation and Control 123
### Part 3: School questions

1. Did the outbreak involve a single or multiple schools?
   - Single
   - Multiple (if yes, number of schools ___)

2. School characteristics (for all involved students in all involved schools)
   - Total approximate enrollment:
     - Unknown or undetermined
   - Grade level(s) (please check all grades affected):
     - Preschool
     - Grade school (grades K–12)
     - College/university/technical school
     - Unknown or undetermined
   - Primary funding of involved school(s):
     - Public
     - Private
     - Unknown or undetermined

3. Describe the preparation of the implicated item:
   - Heat and serve (item mostly prepared or cooked off-site, reheated on-site)
   - Served a-la-carte
   - Serve only (preheated or served cold)
   - Cooked on-site using primary ingredients
   - Provided by a food service management company
   - Provided by a fast food vendor
   - Provided by a pre-plate company
   - Part of a club/fundraising event
   - Made in the classroom
   - Brought by a student/teacher/parent
   - Other
   - Unknown or undetermined

4. How many times has the state, county or local health department inspected this school cafeteria or kitchen in the 12 months before the outbreak?*
   - Once
   - Twice
   - More than two times
   - Not inspected
   - Unknown or undetermined

   *If there are multiple schools involved, please answer according to the most affected school.

5. Does the school have a HACCP plan in place for the school feeding program?*
   - Yes
   - No
   - Unknown or undetermined

   *If there are multiple schools involved, please answer according to the most affected school.

6. Was implicated food item provided to the school through the National School Lunch/Breakfast Program?
   - Yes
   - No
   - Unknown or undetermined

   If Yes, was the implicated food item donated/purchased by:
   - USDA through the Commodity Distribution Program
   - Purchased commercially by the state/school authority
   - Other
   - Unknown or undetermined
### Part 4: Ground beef

1. What percentage of ill persons (for whom information is available) ate ground beef raw or undercooked? ____%
2. Was ground beef case-ready? (Ground beef that comes from a manufacturer packaged for sale and not altered or repackaged by the retailer)
   - Yes
   - No
   - Unknown or undetermined
3. Was the beef ground or reground by the retailer?
   - Yes
   - No
   - Unknown or undetermined
   If yes, was anything added to the beef during grinding (e.g. shop trim or any product to alter the fat content)?

### Part 5: Mode of transmission

(enterohaemorrhagic *E. coli* or *Salmonella* enteritidis only)

1. Mode of transmission (for greater than 50% of cases)
   - Food
   - Person to person
   - Swimming or recreational water
   - Drinking water
   - Contact with animals or their environment
   - Unknown or undetermined

### Part 6: Additional egg questions

1. Were eggs (check all that apply):
   - in-shell, un-pasteurized?
   - in-shell, pasteurized?
   - liquid or dry egg product?
   - stored with inadequate refrigeration during or after sale?
   - consumed raw?
   - consumed undercooked?
   - pooled?

2. If eggs traced back to farm, was *Salmonella* enteritidis found on the farm?
   - Yes
   - No
   - Unknown or undetermined

Comment: ___________________________________________________________
Contamination factors:1

C1 – Toxic substance part of tissue (e.g. ciguatera)
C2 – Poisonous substance intentionally added (e.g. cyanide or phenolphthalein added to cause illness)
C3 – Poisonous or physical substance accidentally/incidentally added (e.g. sanitizer or cleaning compound)
C4 – Addition of excessive quantities of ingredients that are toxic under these situations (e.g. niacin poisoning in bread)
C5 – Toxic container or pipelines (e.g. galvanized containers with acid food, copper pipe with carbonated beverages)
C6 – Raw product/ingredient contaminated by pathogens from animal or environment (e.g. Salmonella enteriditis in eggs, norovirus in shellfish, E. coli in sprouts)
C7 – Ingestion of contaminated raw products (e.g. raw shellfish, produce, eggs)
C8 – Obtaining foods from polluted sources (e.g. shellfish)
C9 – Cross-contamination from raw ingredient of animal origin (e.g. raw poultry on the cutting board)
C10 – Bare-handed contact by handler/worker/preparer (e.g. with ready-to-eat food)
C11 – Glove-handed contact by handler/worker/preparer (e.g. with ready-to-eat food)
C12 – Handling by an infected person or carrier of pathogen (e.g. Staphylococcus, Salmonella, norovirus)
C13 – Inadequate cleaning of processing/preparation equipment/utensils leads to contamination of vehicle (e.g. cutting boards)
C14 – Storage in contaminated environment leads to contamination of vehicle (e.g. store room, refrigerator)
C15 – Other source of contamination (please describe in Comments)

Proliferation/amplification factors:1

P1 – Allowing foods to remain at room or warm outdoor temperature for several hours (e.g. during preparation or holding for service)
P2 – Slow cooling (e.g. deep containers or large roasts)
P3 – Inadequate cold-holding temperatures (e.g. refrigerator inadequate/not working, iced holding inadequate)
P4 – Preparing foods a half day or more before serving (e.g. banquet preparation a day in advance)
P5 – Prolonged cold storage for several weeks (e.g. permits slow growth of psychrophilic pathogens)
P6 – Insufficient time and/or temperature during hot holding (e.g. malfunctioning equipment, too large a mass of food)
P7 – Insufficient acidification (e.g. home canned foods)
P8 – Insufficiently low water activity (e.g. smoked/salted fish)
P9 – Inadequate thawing of frozen products (e.g. room thawing)
P10 – Anaerobic packaging/modified atmosphere (e.g. vacuum packed fish, salad in gas flushed bag)
P11 – Inadequate fermentation (e.g. processed meat, cheese)
P12 – Other situations that promote or allow microbial growth or toxic production (please describe in Comments)

Survival factors:1

S1 – Insufficient time and/or temperature during initial cooking/heat processing (e.g. roasted meats/poultry, canned foods, pasteurization)
S2 – Insufficient time and/or temperature during reheating (e.g. sauces, roasts)
S3 – Inadequate acidification (e.g. mayonnaise, tomatoes canned)
S4 – Insufficient thawing, followed by insufficient cooking (e.g. frozen turkey)
S5 – Other process failures that permit the agent to survive (please describe in Comments)

Method of preparation:2

M1 – Foods eaten raw or lightly cooked (e.g. hard shell clams, sunny side up eggs)
M2 – Solid masses of potentially hazardous foods (e.g. casseroles, lasagna, stuffing)
M3 – Multiple foods (e.g. smorgasbord, buffet)
M4 – Cook/serve foods (e.g. steak, fish fillet)
M5 – Natural toxin (e.g. poisonous mushrooms, paralytic shellfish poisoning)
M6 – Roasted meat/poultry (e.g. roast beef, roast turkey)
M7 – Salads prepared with one or more cooked ingredients (e.g. macaroni, potato, tuna)
M8 – Liquid or semi-solid mixtures of potentially hazardous foods (e.g. gravy, chili, sauce)
M9 – Chemical contamination (e.g. heavy metal, pesticide)
M10 – Baked goods (e.g. pies, eclairs)
M11 – Commercially processed foods (e.g. canned fruits and vegetables, ice cream)
M12 – Sandwiches (e.g. hot dog, hamburger, Monte Cristo)
M13 – Beverages (e.g. carbonated and non-carbonated, milk)
M14 – Salads with raw ingredients (e.g. green salad, fruit salad)
M15 – Other, does not fit into above categories (please describe in Comments)
M16 – Unknown, vehicle was not identified