

2003 Fiscal Year Summary Foodborne Illness Surveillance

**Michigan Department of Agriculture
Food and Dairy Division**

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Information presented in this summary is derived from the Michigan Department of Agriculture Foodborne Illness Surveillance Database, with data originating from reports sent by local health agencies, as of February 27, 2004.

Summary

The Michigan Department of Agriculture (MDA) maintains a database of reported events that meet the Michigan definition¹ of a foodborne illness outbreak. This summary of reported events that occurred during the 2003 fiscal year is intended to help state and local food safety officials to better understand, monitor and prevent the causes of foodborne illness in Michigan.

¹ **Foodborne Illness Outbreak-** Incidents involving two or more unrelated cases having similar features or involving the same pathogen; single incidents of certain rare foodborne pathogens. (based on definition in Michigan Food Law, P.A. 92 of 2000, Section 3103)

Results and Discussion:

During the fiscal year, a total of **232** alleged foodborne illness outbreaks, involving **2158** illnesses, were reported to MDA.

- Local health agencies, the Michigan Department of Agriculture, the Michigan Department of Community Health and, on occasion, federal agencies, collaboratively investigated these reports and complaints.
- Gastrointestinal infections are not limited to foodborne transmission; they can be transmitted by person-to-person contact, contact with infected animals, contact with contaminated surfaces and through contaminated water. In smaller incidents, non-foodborne transmission often cannot be discounted.
- In Figure 4, the month of December 2002 and March 2003 show significant increases of illness. In December 2002, a *Clostridium perfringens* outbreak caused illness in 148 individuals. Additionally during that month, Norovirus caused six large outbreaks. Norovirus was also implicated in six outbreaks during March 2003; the largest outbreak involved an estimated 150 illnesses.
- The leading causative agents identified for reported foodborne illness outbreaks were:

<u>Agent:</u>	<u># Ill:</u>	<u># of Events:</u>
Norovirus	937	25
<i>Clostridium perfringens</i>	199	3

The causative agent was identified in only 15% of reported foodborne illness outbreaks. Identifying the causative agents of foodborne illness outbreaks is important because appropriate control strategies differ for various agents. For example, while ill humans are the reservoirs of Norovirus, both humans and raw foods of animal origin can carry *Clostridium perfringens*.

- A relatively few outbreaks accounted for a majority of the illnesses. Fifty outbreaks involving 10 or more person (22% of all reported outbreaks) accounted for 1539 of illnesses (71% of all reported outbreak illnesses).
- The median size of reported outbreaks was 3 persons.
- The most frequently cited causes of reported foodborne illness outbreaks noted on CDC 52.13 forms were bare-hand contact by food handler/worker/preparer and handling of food by an infected person or carrier of pathogen. (Figure 5)
- It is widely recognized that the number of reported foodborne illnesses represents a small fraction of the total cases that occur. Due to this under reporting and other factors, the number of foodborne illnesses reported cannot be interpreted as an indicator of the relative safety of foods in any jurisdiction. For example, five agencies (Oakland, Kent, Wayne, Macomb and Genesee) reported approximately 50% of foodborne illness outbreaks. These are large population centers and likely reflect concomitant investigation and surveillance efforts.

Highlights of Outbreak Investigations:

1. In January, approximately 100 illnesses, including 4 hospitalizations- of which one person required defibrillation in the ER- resulted from ingestion of meat contaminated with a nicotine-containing pesticide. Staff from MDA, the Michigan Department of Community Health, the grocery chain that sold the contaminated product, and federal and local regulatory agencies collaborated in the investigation. The incident led to the recall of approximately 1,700 pounds of ground beef. In May, a former store employee pled guilty to deliberate contamination of the ground beef, and was sentenced to prison in September. The following article provides details of the investigation:
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5218a3.htm>
2. Norovirus outbreaks were widespread throughout the United States this past year, and Michigan was no exception. Noroviruses were the most frequently identified etiological agent in foodborne outbreaks reported by Michigan's local health departments during the year. A total of 25 Norovirus outbreaks involving 937 persons were reported. Norovirus outbreaks are typically caused when an infected foodworker handles food in an unsanitary manner. The Michigan Food Law of 2000, which took effect in November 2001, contains important safeguards which should help reduce the risk of Norovirus outbreaks, including requirements related to employee health, hand washing, and preventing food contamination through contact with food worker hands.
3. In July, an outbreak from a picnic held at a family farm was caused by a unique strain of *Salmonella enteritidis*. The investigation team consisted of state and local health department staff, MDA staff and Michigan State University staff. Investigators found that the family housed a traveling petting zoo, and had been caring for a sick wallaby prior to the outbreak. The local health department determined that the wallaby's symptoms were similar to those affected by the outbreak. After the wallaby died, its tissues were tested and found to contain the outbreak strain of *Salmonella enteritidis*. Investigation findings indicated the

wallaby transmitted the organism strain via food and the environment. This investigation highlighted the importance of considering all possible routes of transmission when conducting a thorough outbreak investigation.

Reporting:

- MDA uses foodborne illness data to investigate emerging threats, to illustrate trends, and to ensure accurate reports are reflected at the state and national level.
- In the Summer of 2003, foodborne illness reporting became more streamlined. Local health agencies no longer needed to submit single alert and family complaints to MDA.
- In certain cases, Termination Reports were accepted as substitutes for final written reports. Termination Report forms are used in the following situations:
 - When events are determined not to be foodborne illness outbreaks after investigation
 - For incidents where complainants refuse to provide sufficient information to conduct a proper investigation
 - For incidents reported to agencies so late that an adequate investigation cannot be completed

When a Termination Report is completed, reasons for its use must be indicated on that form.

- Final reports or termination reports were received for 86% of reported foodborne illness outbreaks in fiscal year 2003.

Foodborne Illness Response Strategy Training (F.I.R.ST.)

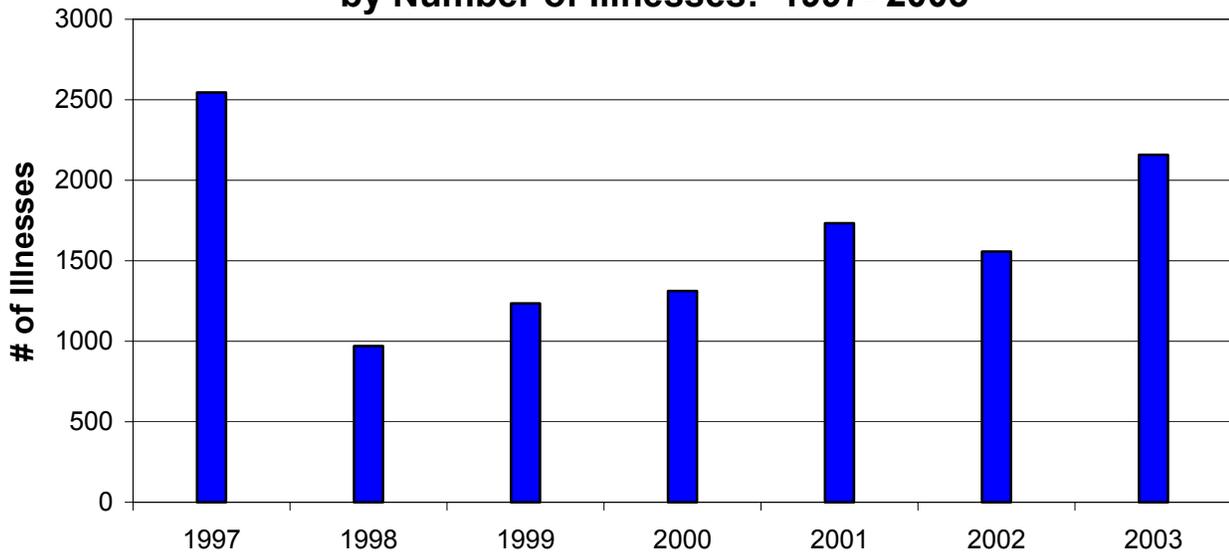
In fiscal year 2003, staff from MDCH, MDA and local health collaborated to provide a series of two-day training sessions on successful foodborne illness outbreak investigations, with an emphasis on teamwork. Thirteen two-day training sessions were held throughout the state, for sanitarians, nurses, epidemiologists and other involved in foodborne illness outbreak investigations.

Recommendations

State and local food safety agencies should:

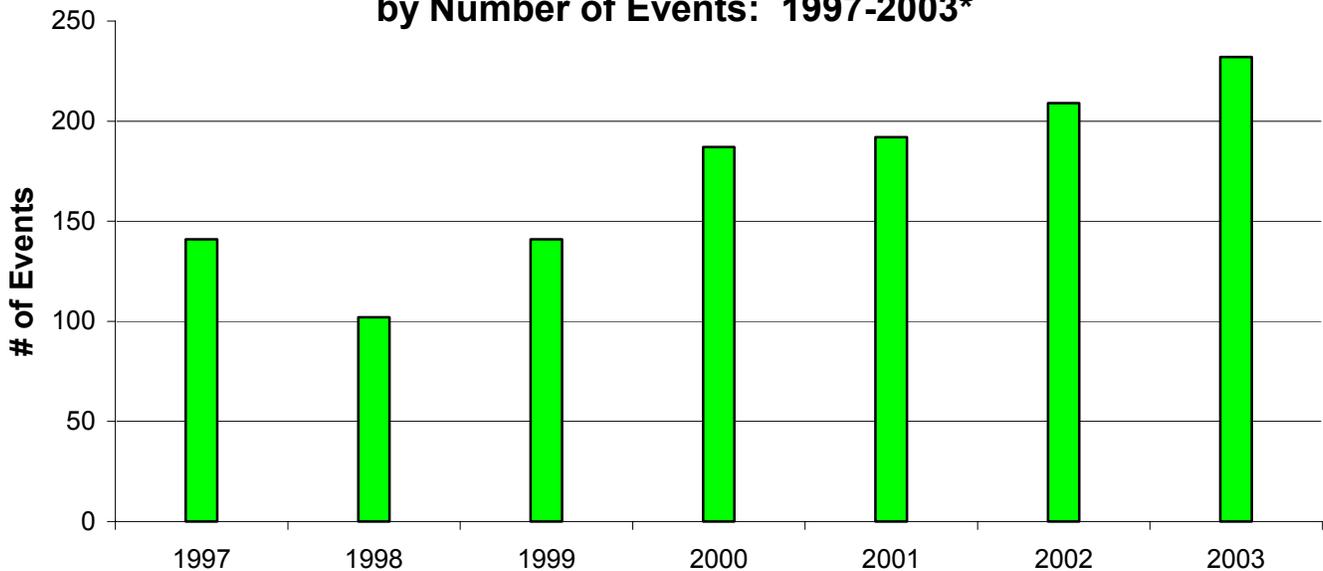
1. Ensure that staff investigating foodborne illness outbreaks:
 - a) are adequately trained before being assigned these tasks, and
 - b) maintain their skill through periodic participation in training programs focusing on outbreak investigation techniques.
2. Continue emphasis on minimizing bare-hand contact with ready-to-eat foods.
3. Continue emphasis on exclusion and/or restriction of ill food handlers.
4. Evaluate hot-holding practices, to ensure proper time and temperature standards for foods (meets requirements in Section 3-401.13, 3-403.11 and 3-501.16 of the 1999 Food Code).
5. Evaluate the potential for cross-contamination within each facility during both environmental assessments and routine inspections.
6. Evaluate cooling practices to ensure rapid cooling of potentially hazardous foods (meets requirements in Sections 3-501.14 & 15 of the 1999 Food Code).
7. Identify higher percentages of etiologic agents causing foodborne illness outbreaks, through appropriate laboratory testing.

Summary of Foodborne Illness Outbreaks, by Number of Illnesses: 1997- 2003*



*Statistics from 2002 and 2003 are based on the MDA fiscal year rather than on calendar year

Summary of Foodborne Illness Outbreaks, by Number of Events: 1997-2003*



*Statistics from 2002 and 2003 are based on the MDA fiscal year rather than on calendar year

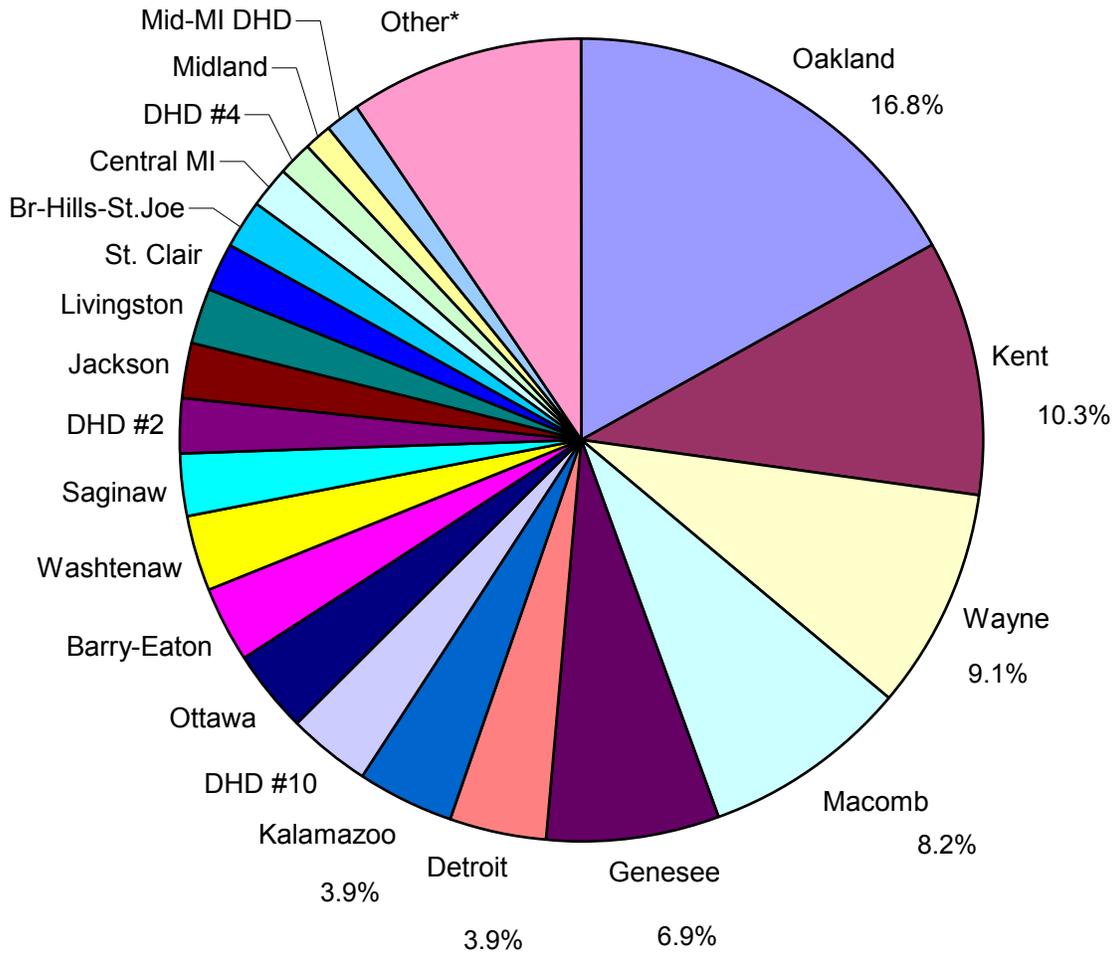
Foodborne Illness Outbreaks by Local Health Department

		% of	% of		% of Total	Reports	Missing
Jurisdiction	FBI Outbreaks	Total FBIs	Total MI FSEs	Population	Population	Filed w/ State	Reports*
Oakland	39	16.8	12.5	1,202,721	12.0	29	10
Kent	24	10.3	6.3	587,951	5.8	23	1
Wayne	21	9.1	9.0	1,120,489	11.1	20	1
Macomb	19	8.2	7.1	808,529	8.0	19	0
Genesee	16	6.9	4.4	441,423	4.4	10	6
Detroit	9	3.9	6.0	925,051	9.2	1	8
Kalamazoo	9	3.9	2.4	241,471	2.4	9	0
DHD #10	8	3.4	2.8	261,216	2.6	8	0
Ottawa	8	3.4	2.3	218,555	2.2	8	0
Barry-Eaton	7	3.0	1.6	163,533	1.6	7	0
Washtenaw	7	3.0	3.6	334,351	3.3	7	0
Saginaw	6	2.6	2.3	210,087	2.1	5	1
DHD #2	5	2.2	0.9	69,641	0.7	4	1
Jackson	5	2.2	1.5	160,972	1.6	0	5
Livingston	5	2.2	1.1	168,862	1.7	5	0
St. Clair	5	2.2	1.0	167,712	1.7	5	0
Br-Hills-St.Joe	4	1.7	1.5	155,535	1.5	4	0
Central Michigan	4	1.7	1.9	189,459	1.9	4	0
DHD #4	3	1.3	1.1	82,978	0.8	3	0
Midland	3	1.3	0.7	84,119	0.8	3	0
Mid-MI DHD	3	1.3	1.7	171,453	1.7	3	0
Bay	2	0.9	1.1	109,672	1.1	2	0
Calhoun	2	0.9	1.5	138,375	1.4	2	0
Chippewa	2	0.9	0.6	38,898	0.4	2	0
Delta-Menomine	2	0.9	0.8	63,445	0.6	2	0
Grand Traverse	2	0.9	1.0	81,263	0.8	2	0
Marquette	2	0.9	0.8	64,342	0.6	2	0
Monroe	2	0.9	1.4	149,253	1.5	2	0
Western UP	2	0.9	1.1	71,891	0.7	2	0
Allegan	1	0.4	1.0	109,336	1.1	1	0
Huron	1	0.4	0.6	35,422	0.4	1	0
Ingham	1	0.4	3.0	281,362	2.8	1	0
Ionia	1	0.4	0.6	62,941	0.6	1	0
Tuscola	1	0.4	0.5	58,249	0.6	1	0
Van Buren- Cass	1	0.4	1.2	128,519	1.3	1	0
TOTAL	232	100%					
Estimated Michigan Population = 10,050,446 (2002 est.)							
*As of February 27, 2004 Michigan Foodservice Establishments = 37, 419 (approx)							

NOTE: The number of reported illnesses cannot be interpreted as indicating the relative risk or safety of food in any jurisdiction.

Foodborne Illness Outbreaks by Local Health Departments

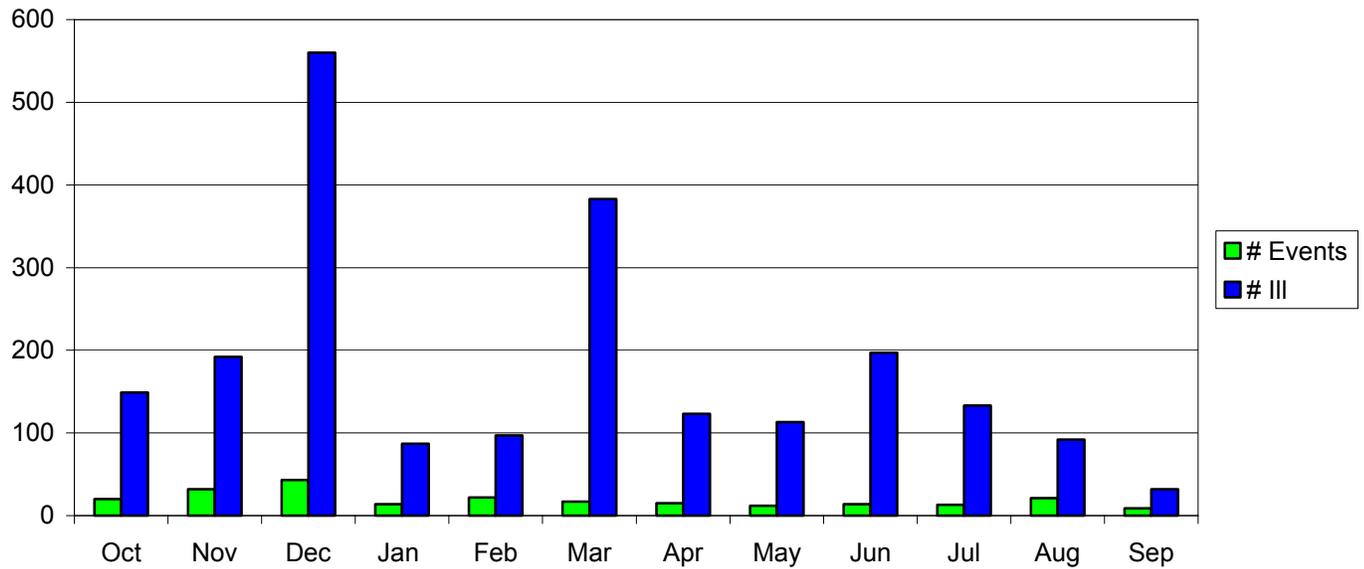
N= 232



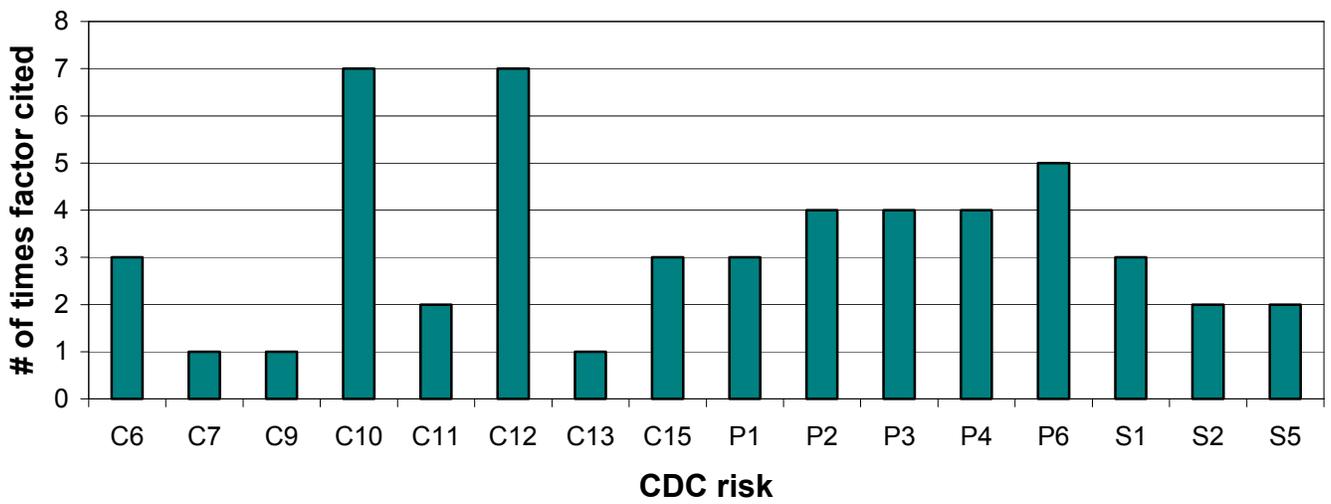
Note: The number of reported events cannot be interpreted as indicating the relative risk or safety of food in any jurisdiction.

*LHDs reporting 1 or 2 Foodborne Illness Outbreaks:
 Two outbreaks: Bay, Calhoun, Chippewa, Delta-Menominee, Grand Traverse, Marquette, Monroe, Western UP
 One outbreak: Allegan, Huron, Ingham, Ionia, Tuscola, Van Buren/Cass

Foodborne Illness Outbreaks, by Month -- Fiscal Year 2003



Factors Contributing to Fiscal Year 2003 Foodborne Illness Outbreaks, for Reports Citing a Primary Factor



See page 12 for CDC risk definitions

This questionnaire is authorized by law (Public Health Service Act, 42 USC §241). Although response to the questions asked is voluntary, cooperation of the patient is necessary for the study and control of disease. Public reporting burden for this collection of information is estimated to average 15 minutes per response. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to PHS Reports Clearance Officer, Rm 721-H, Humphrey Bg, 200 Independence Ave. SW, Washington, DC 20201; ATTN: PRA, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

The following codes are to be used to fill out Part 1 (question 9) and Part 2 (question 15).

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 enteritidis* in egg, Norwalk 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*, Norwalk agent)
- 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 toxicant (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

¹ Frank L. Bryan, John J. Guzewich, and Ewen C. D. Todd. Surveillance of Foodborne Disease III. Summary and Presentation of Data on Vehicles and Contributory Factors; Their Value and Limitations. *Journal of Food Protection*, 60; 6:701-714, 1997.

² Weingold, S. E., Guzewich JJ, and Fudala JK. Use of foodborne disease data for HACCP risk assessment. *Journal of Food Protection*, 57; 9:820-830, 1994.