



Michigan Department of Agriculture

Food Service Annual Report 2005

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INTRODUCTION

Food safety in Michigan restaurants is a partnership between the Michigan Department of Agriculture (MDA) and Michigan's 45 local health departments (LHDs). MDA provides statewide program policy and direction as well as consultation, training and evaluation services to LHDs. LHDs are delegated the authority to conduct the program and enforce the requirements of the Michigan Food Law of 2000, as amended, pertaining to food service establishments. LHDs report information on various food safety program activities quarterly. The quarters run according to the State of Michigan fiscal year (FY), which begins each October 1.

Additionally, local health departments report to MDA on all foodborne illness outbreak events. This report summarizes statewide program activity and foodborne illness outbreak information reported for the period of October 1, 2004 through September 30, 2005 and includes annexes that provide details relative to each local health department.

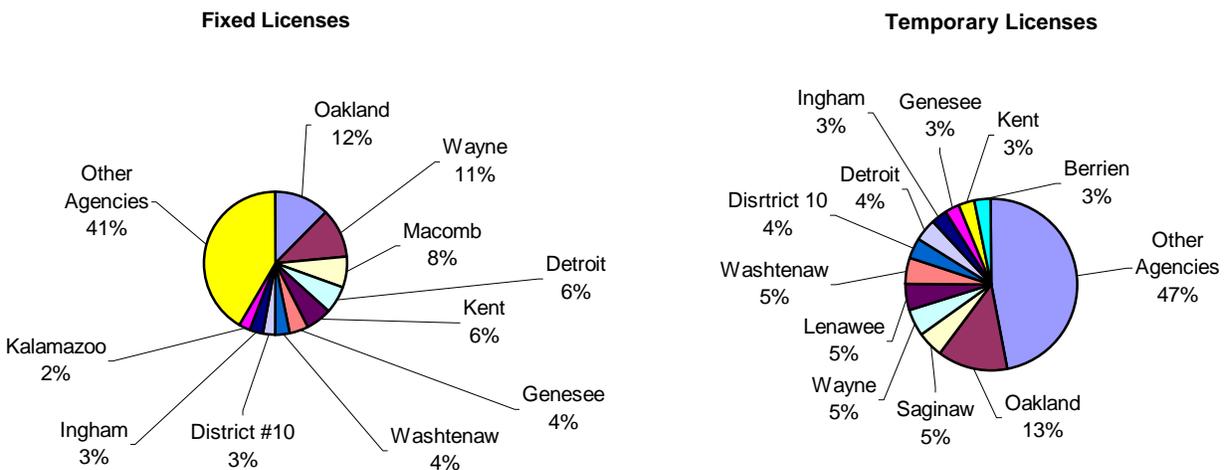
A. FOOD SERVICE PROGRAM

WORKLOAD

Licensed Establishments	<u>2003/04</u>	<u>2004/05</u>	<u>+/(-)%</u>
Fixed Food & Mobile Commissary.....	29,721	31,168	4.9
Temporary.....	11,193	11,575	3.4
Mobile.....	342	459	34.2
Vending.....	4,572	5,015	9.7
Special Transitory Food Unit (STFU)...	<u>528</u>	<u>645</u>	<u>22.2</u>
Total Licensed Establishments.....	<u>46,356</u>	<u>48,862</u>	<u>5.4</u>
 Number of licensed establishments per FTE* assigned to conduct inspections	 _____	 273	 NA

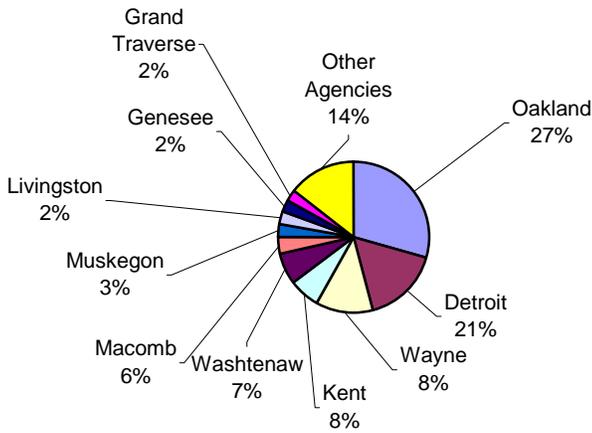
Licensing data from MDA, Food & Dairy Division Annual Reports.

Distribution of License Types by Local Health Department

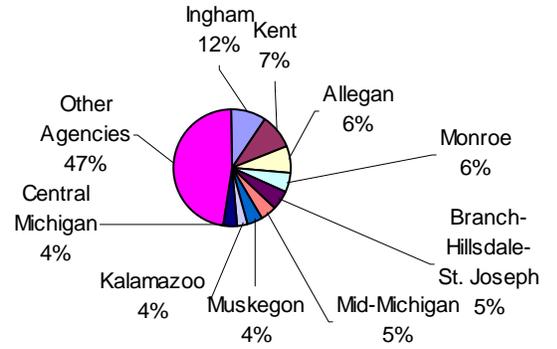


*FTE=Full time equivalent

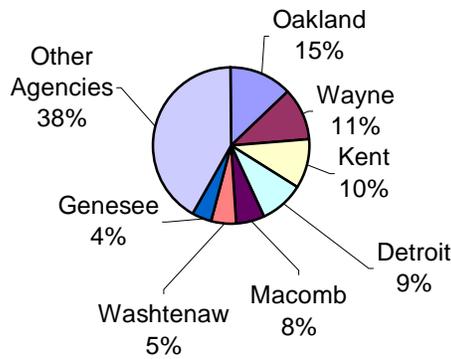
Mobile Licenses



Special Transitory Food Unit (STFU) Licenses



Vending Licenses



WORKFORCE

	LHD Actual	FDA Recommendation Minimum	FDA Recommendation Recommended
Number of FTEs assigned to conduct food establishment inspections (all types).....	180	204	287
Number of FTEs involved in plan review, management and administrative support.....	110	NA	NA
Total Number of FTEs.....	290	NA	NA
Number of standardized trainers.....	65	NA	NA

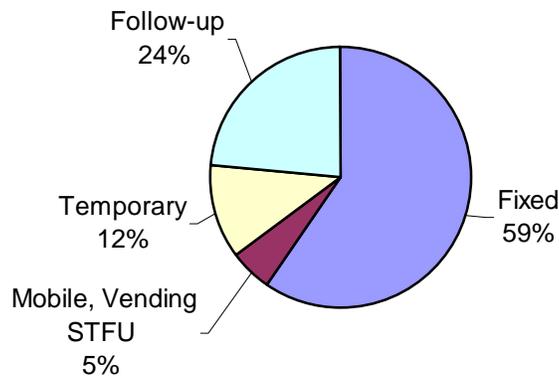
PROGRAM OUTPUT

I. Inspections

Establishment Type	Inspections Conducted	Inspections Due
Fixed food service – routine	56,875	
Mobile, Vending, STFU.....	5,608	
Sub-Total.....	62,483	62,949
Follow-up.....	22,909	
Temporary food service.....	11,575	
Grand Total.....	96,967	

Average number of inspections per FTE assigned to conduct food establishment inspections..... 538

Michigan Food Service Inspections by Type



II. Plan Review

Number of plans received for review.....	2,049
Number of plans approved.....	1,771

III. Investigations

Consumer complaints investigated (all types).....	4,420
Foodborne illness outbreaks (met MI definition).....	176

IV. Enforcement

Administrative action (office conference, informal hearing, formal hearing, civil fine, order).....	1,636
Court action (civil, criminal).....	7

BUDGETED PROGRAM REVENUE

	FY 2003/04	FY 2004/05
Fees collected*.....	8,398,780	9,441,840
Local tax dollars*.....	8,598,392	9,064,115
Local public health operations (LPHO) dollars from state*.....	<u>8,248,965</u>	<u>8,201,348</u>
Total program revenue.....	<u>25,246,137</u>	<u>26,707,303</u>

*Source: Michigan Department of Community Health, Comprehensive Planning and Budgeting Contracts.

GENERAL STATISTICS

Occurrence per 100,000 population

Number of fixed food service est.	355
Food related complaints.....	42
Foodborne illness outbreak investigations.....	1.74

Program Dollars Spent Per

Licensed establishment	\$677
FTE assigned to the program.....	\$92,094
Michigan citizen.....	\$2.70

B. FOODBORNE ILLNESS OUTBREAK REPORTING

SUMMARY

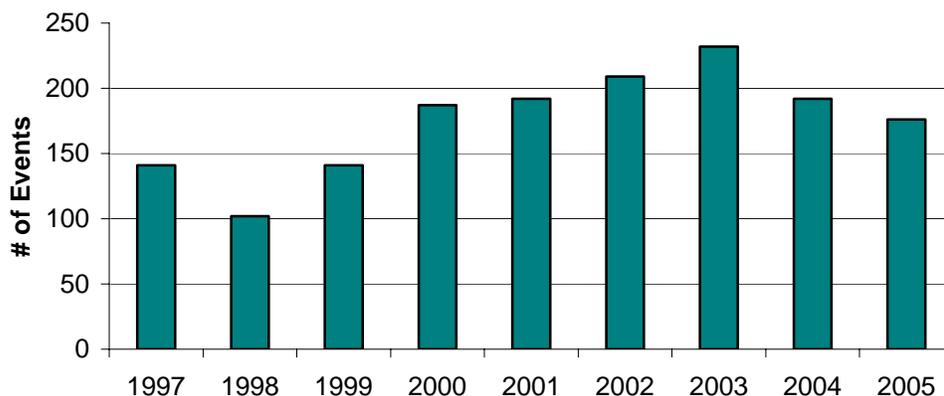
The Michigan Department of Agriculture (MDA) maintains a database of reported events that meet the Michigan definition of a foodborne illness outbreak. This comprises incidents involving two or more unrelated cases having similar features or involving the same pathogen and single incidents of certain rare foodborne pathogens (based on definition in Michigan Food Law, P.A. 92 of 2000, Section 3103).

I. Overview of Results

Total foodborne illness outbreak complaints:	176
Total number of illnesses:.....	1,546
Median illnesses per outbreak:.....	4
Leading causative agents:	
Norovirus.....	18 events; 626 illnesses
Salmonella spp.	5 events; 67 illnesses

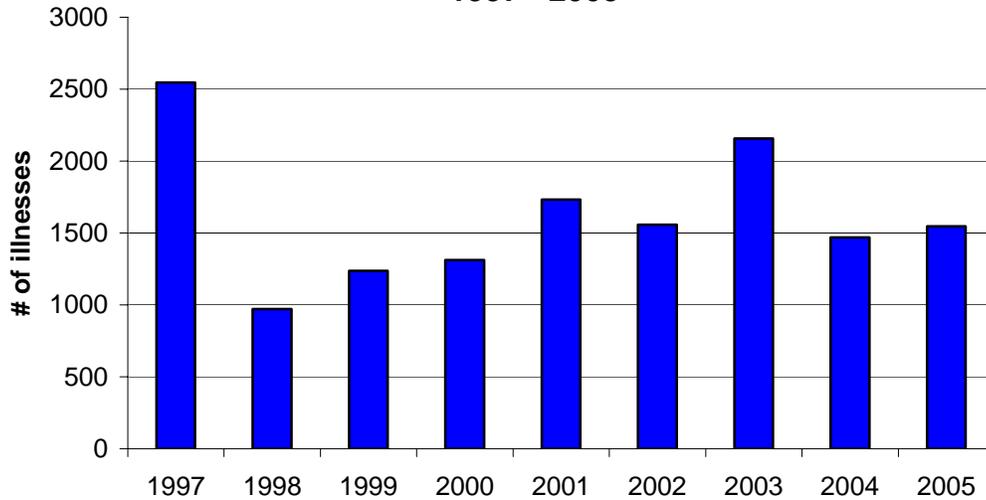
Note: Causative agents were identified for 14.2 percent of reported foodborne illness outbreaks.

Summary of Foodborne Illness Outbreaks, by Number of Events: 1997 - 2005



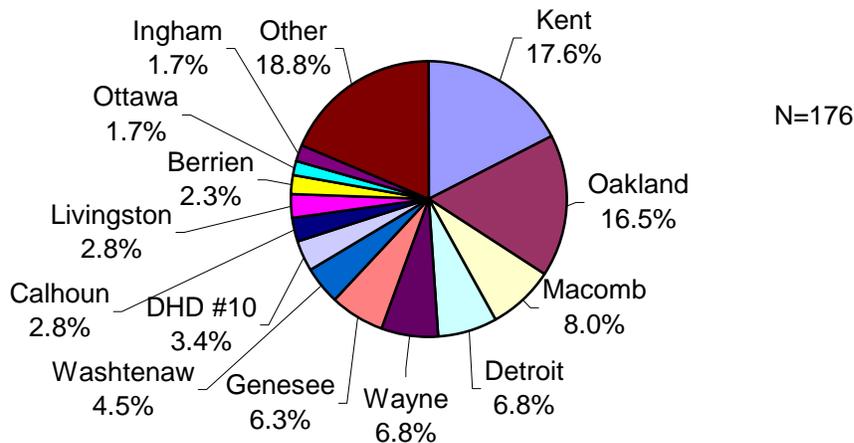
Note: Statistics prior to 2002 were based on the calendar year rather than on the fiscal year.

Summary of Foodborne Illness Outbreaks, by Number of Illnesses, 1997 - 2005



Note: Statistics prior to 2002 were based on the calendar year rather than on the fiscal year.

Foodborne Illness Outbreaks by Local Health Department

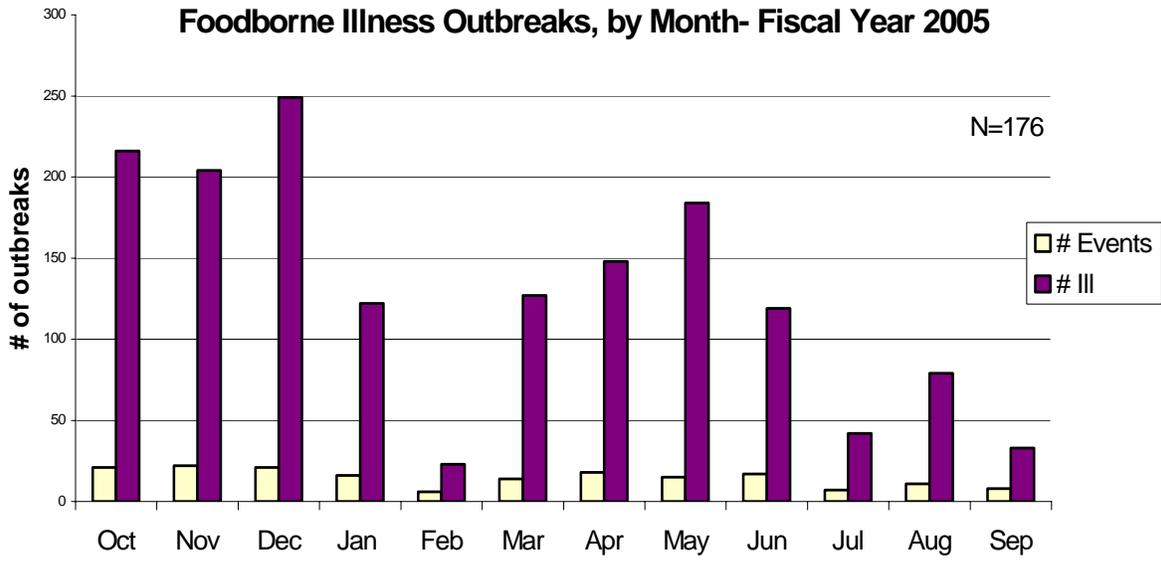


Note: The number of reported events cannot be interpreted as indicating the relative risk or safety of food in any jurisdiction.

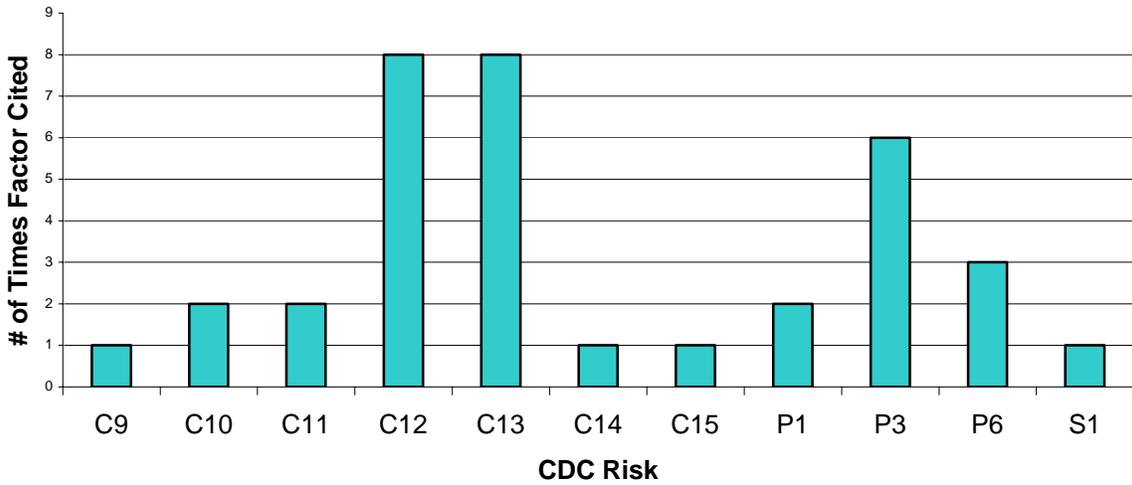
*LHDs reporting 1 or 2 Foodborne Illness Outbreaks:

Two outbreaks: Br-Hills-St. Joe, Jackson, Lapeer, Central MI, Van Buren/Cass, Marquette, St. Clair, Saginaw, Mid-MI DHD

One outbreak: DHD #2, Benzie-Leelanau, Northwest MI, Chippewa, Delta-Menominee, Kalamazoo, Monroe, Lenawee, Grand Traverse, Midland, Ionia, Bay, Livingston, Muskegon, Dickinson-Iron



Factors Contributing to Fiscal Year 2005 Foodborne Illness Outbreaks, for Reports Citing a Primary Factor



See Appendix V for definition of risk factors

II. Discussion

- Local health departments, the Michigan Department of Agriculture, the Michigan Department of Community Health and, on occasion, federal agencies, collaborated on many of the outbreaks.
- 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 ruled out.
- In general, outbreak numbers were higher during the winter months. *Norovirus*, the number one cause of foodborne illness outbreaks in the United States, is most prevalent during winter.
- Causative agents for outbreaks were identified for 14.2 percent of reported foodborne illness outbreaks. This percentage increased from FY 2004, during which a causative agent was only identified in 9.4 percent of outbreaks. Identifying the causative agents of foodborne illness outbreaks is important because appropriate control strategies differ for various agents. For example, while humans are reservoirs for *Norovirus*, both humans and raw foods of animal origin can carry *Salmonella*.
- Relatively few outbreaks accounted for a majority of the illnesses. Thirty-nine outbreaks involving 10 or more persons (22 percent of all reported outbreaks) accounted for 1,044 illnesses (68 percent of all reported outbreak illnesses).
- The Centers for Disease Control and Prevention (CDC) have identified five behaviors and practices as being key contributing factors of foodborne illness:
 - Poor personal hygiene
 - Food from unsafe sources
 - Inadequate cooking
 - Improper holding temperatures
 - Contaminated food equipment

Michigan data helps support this CDC finding. The most frequently cited causes of reported foodborne illness outbreaks noted on CDC 52.13 forms were handling of food by an infected person or carrier of pathogen, inadequate cleaning of food equipment and utensils, and inadequate cold-holding temperatures (see second graph on previous page).

- It is widely recognized that the number of reported foodborne illnesses represent a small fraction of the total cases that occur. Due to this underreporting 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, seven agencies (Kent, Oakland, Macomb, Detroit, Wayne, Genesee and Washtenaw) reported approximately 66.5 percent of foodborne illness outbreaks. Health departments with larger populations would be expected to have higher numbers of outbreaks.

III. Outbreak Highlights

Norovirus Outbreaks

During FY 2005, *Norovirus* was the leading cause of laboratory-confirmed foodborne illness outbreaks. Of 25 laboratory-confirmed outbreaks, 18 (72 percent) were due to *Norovirus*. *Norovirus* outbreaks are typically transmitted via food after an infected foodhandler handles food in an unsanitary manner. In December 2004, a *Norovirus* outbreak at a small Christian school in Kent County occurred after students and staff consumed cheeseburgers from a local fast food restaurant. At least 33 individuals became ill. The food handler who had prepared the meal had been ill with similar symptoms ten days prior to preparing the food. *Norovirus* can be transmitted for *at least* up to 14 days after symptoms have subsided (CDC). This was evident in a different outbreak in December 2004. One individual had a stool sample test positive for *Norovirus* fifteen days after the illness subsided.

In May 2005, another series of *Norovirus* outbreaks further highlighted the public health significance of an asymptomatic food service worker handling food while still shedding virus. Five *Norovirus* outbreaks involving at least 124 individuals occurred after a food handler, who was previously ill with *Norovirus*, prepared submarine sandwiches at a national submarine sandwich franchise. Local health department staff discussed the newly developed *Michigan Guidelines for Environmental Cleaning and Disinfection of Norovirus* with the food service establishment and the establishment implemented these guidelines. This series of outbreaks had high economic impact, such as lost work time for ill individuals and the weeklong closure of the implicated sandwich franchise. Additionally, a lawsuit was filed against the franchise by a nationally known foodborne illness law firm. This outbreak was highlighted in a CDC Morbidity and Mortality Weekly Report article:
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5514a3.htm>

Examples of Other Outbreaks

An elderly Livingston County male died of botulism in January. Botulism is a severe intoxication caused by toxins produced by *Clostridium botulinum* bacteria. Symptoms of foodborne botulism include blurred vision, difficulty in swallowing and progressive paralysis. The patient had been hospitalized and placed on a respirator prior to his death. Because botulism is a Category A bioterrorism agent, single cases receive intense scrutiny. Evidence gathered to date by MDA, MDCH and local health department investigators does not suggest intentional contamination of food in this case.

An outbreak involving 27 ill people occurred in mid-August after a church fundraiser in Grand Traverse County. It was found that the taco meat contained *Bacillus cereus* toxins due to improper cooling after preparation.

An outbreak of *Salmonella enteritidis* associated with consumption of éclairs and cream desserts occurred after an April concert reception held in Macomb County. Although the reconstituted cream filling was implicated, it was never determined how the contamination occurred.

A Lapeer County restaurant was closed temporarily after 20 persons became ill over a period of time after eating different foods. *Salmonella enteritidis* had been isolated from six of the ill

individuals. Investigators concluded that the infection appeared to be associated with infected food workers handling multiple food items.

IV. Reporting

- MDA uses foodborne illness data to investigate emerging threats, illustrate trends, and ensure accurate reports are reflected at the state and national level.
- Revised foodborne illness reporting and documentation guidance was issued in February 2006. Please see: <http://www.mda.state.mi.us/industry/fooddata/Unit.asp>.
- In FY 2005, final reports or termination reports were received for 90 percent of reported foodborne illness outbreaks.
- Accreditation findings show that 81 percent of local health departments were found to respond to a foodborne illness complaint within 24 hours of notification (Minimum Program Requirement 6.1), and 50 percent met foodborne illness investigation procedure requirements relating to documentation and reporting of foodborne illness outbreaks (Minimum Program Requirement 6.2).

V. Recommendations

1. Emphasize exclusion and/or restriction of ill food handlers, discussing the risk of transmission and the health and financial consequences that could ensue.
2. Focus on finding and eliminating unsafe food handling practices that are highly associated with foodborne illness during routine food safety inspections.
3. Evaluate cleaning and sanitizing practices when an employee or customer vomits in a food service establishment, according to the "*Local Health Department Guidelines for Environmental Cleaning and Disinfection of Norovirus.*"
4. Evaluate cleaning and sanitizing practices for food equipment and utensils.
5. Evaluate cold-holding practices, ensure proper time and temperature standards for foods.
6. Identify higher percentages of etiologic agents causing foodborne illness outbreaks through appropriate laboratory funding.
7. In final reports and termination reports for outbreaks, give a conclusion stating whether or not the outbreak was deemed foodborne based on investigation findings.

Appendix I - Draft

FY 2004/05 Workload – Output Data

Michigan Local Health Department Quarterly Reports Summary 2005

	INSPECTIONS CONDUCTED					INSPECTIONS DUE	PLAN REVIEW		INVESTIGATIONS	
	3. Fixed food establishments	4. Mobile, vending & sfu	5. Temporary food establishments	6. Follow-up inspections	Total Number of Inspections Conducted (all inspection types)	7. Fixed, mobile, vending & sfu inspections due (annual total)	8. Number of plans received for review	9. Number of plans approved	10. Consumer Complaints Investigated	Number of Consumer Complaints per 100,000 People
Allegan	522	70	71	162	825	390	9	8	10	9.49
BEDHD	951	56	215	230	1,452	1058	39	35	33	19.83
Bay	657	34	128	57	876	759	29	27	58	52.98
Benzie-Leelanau	325	11	136	186	658	313	5	4	9	22.71
Berrien	1,192	44	316	188	1,740	1,153	18	8	71	43.52
BHSJ	1,145	182	233	160	1,720	657	21	22	58	36.97
Calhoun	880	243	166	281	1,570	1,054	29	26	77	55.37
CMDHD	1,253	46	258	1,344	2,901	2,772	43	38	78	40.89
Chippewa	294	10	53	112	469	307	7	1	33	85.07
Delta-Menominee	443	30	167	123	763	473	9	10	17	26.75
Detroit City	3,155	403	489	1,307	5,354	3,558	70	74	213	23.66
Dickinson-Iron	361	13	29	59	462	462	2	2	4	10.02
DHD # 2	511	86	204	81	882	589	62	17	24	34.39
DHD # 4	478	2	86	166	732	599	19	20	23	27.77
DHD # 10	1,435	130	511	347	2,423	1,790	59	39	81	30.50
Genesee	2,269	204	360	364	3,197	2,714	98	90	284	63.97
Grand Traverse	554	73	25	123	775	699	20	15	15	18.13
Holland City	244	81	79	252	656	246	11	8	22	63.57
Huron	299	13	114	186	612	610	7	8	3	8.58
Ingham	1,571	134	391	459	2,555	1,513	71	72	191	68.20
Ionia	245	32	202	107	586	340	11	10	26	40.39
Jackson	718	129	106	87	1,040	867	38	21	69	42.34
Kalamazoo	1,468	23	208	230	1,929	1,522	68	69	71	29.49
Kent	3,507	293	351	1,585	5,716	4,020	124	102	214	36.03
Lapeer	483	46	96	98	723	531	16	17	41	44.32
Lenawee	509	82	567	212	1,370	584	28	23	55	54.04
Livingston	689	45	122	124	980	773	37	27	115	64.77
LMAS	455	6	155	143	759	183	9	4	15	40.69
Macomb	4,150	205	398	1,578	6,331	4,355	147	161	399	48.50
Marquette	491	47	111	173	822	538	13	11	31	47.78
Midland	558	50	139	106	853	637	23	20	35	41.36
Mid-Michigan	913	160	250	435	1,758	968	50	41	23	13.16
Monroe	862	99	165	263	1,389	872	26	19	82	53.75
Muskegon	723	101	184	248	1,256	824	25	16	139	79.70
Northwest	926	45	196	266	1,433	1,022	29	26	16	14.68
Oakland	8,593	1,287	1,541	5,111	16,532	9,685	304	274	872	71.87
Ottawa	1,032	87	191	709	2,019	1,025	48	40	84	37.36
Saginaw	1,378	51	605	243	2,277	1,290	41	44	94	44.96
Sanilac	236	17	53	10	316	271	10	10	4	8.92
Shiawassee	234	19	68	23	344	238	7	5	6	8.21
St. Clair	980	34	213	187	1,414	906	28	25	70	40.96
Tuscola	286	9	105	229	629	629	7	6	11	18.76
VanBuren-Cass	594	44	190	73	901	715	13	7	4	3.07
Washtenaw	1,964	167	550	548	3,229	2,128	76	67	181	53.36
Wayne	5,738	660	598	3,765	10,761	7,852	220	178	441	39.52
Western UP	604	5	180	189	978	665	23	24	18	25.33
Totals	56,875	5,608	11,575	22,909	96,967	62,949	2,049	1,771	4,420	XXX
Average	1,236	122	252	498	2,108	1,464	45	39	96	43.71
Median	704	51	187	189	1,148	773	27	22	48	XXX
Minimum	234	2	25	10	316	183	2	1	3	3
Maximum	8,593	1,287	1,541	5,111	16,532	9,685	304	274	872	85

Appendix II – Draft FY 2004/05 Output Data – Licensing Data

Michigan Local Health Department Quarterly Reports Summary 2005

	ENFORCEMENT CONDUCTED		LICENSED FACILITIES											
	12. Administrative Action: office conference, informal conference, formal hearing, civil fines, orders	13. Court Action: civil, criminal	Licensed Fixed Food Establishments	Fixed Licenses- % of Total Fixed Licenses	Licensed Mobile Establishments	Mobile Licenses- % of Total Mobile Licenses	Licensed STFU Establishments	STFU Licenses- % of Total STFU Licenses	Licensed Vending Establishments	Vending Licenses- % of Total Vending Licenses	Licensed Temporary Establishments (Number of temporary inspections used to equal # of Licenses)	Temporary Licenses- % of Total Temporary Licenses	Total Licensed Establishments (excluding temporary)	Fixed Food Establishments per 100,000 people
Allegan	0	0	321	1	0	0	41	6	28	1	71	1	390	305
BEDHD	54	0	499	2	5	1	10	2	61	1	215	2	575	300
Bay	10	0	407	1	2	0	2	0	22	0	128	1	433	372
Benzie-Leelanau	0	0	178	1	4	1	2	0	5	0	136	1	189	449
Berrien	6	0	635	2	7	2	3	0	74	1	316	3	719	389
BHSJ	10	0	506	2	5	1	34	5	118	2	233	2	663	323
Calhoun	1	0	486	2	7	2	11	2	80	2	166	1	584	349
CMDHD	7	0	294	1	0	0	25	4	14	0	258	2	333	154
Chippewa	7	0	197	1	1	0	0	0	5	0	53	0	203	508
Delta-Menominee	2	0	265	1	0	0	9	1	19	0	167	1	293	417
Detroit City	97	0	1756	6	96	21	4	1	434	9	489	4	2290	195
Dickinson-Iron	1	0	209	1	1	0	1	0	14	0	29	0	225	523
DHD # 2	34	0	333	1	0	0	6	1	8	0	204	2	347	477
DHD # 4	0	0	416	1	1	0	6	1	3	0	86	1	426	502
DHD # 10	4	0	955	3	4	1	25	4	83	2	511	4	1067	360
Genesee	40	1	1308	4	9	2	19	3	176	4	360	3	1512	295
Grand Traverse	2	0	306	1	9	2	15	2	55	1	25	0	385	370
Holland City	1	0	127	0	0	0	7	1	49	1	79	1	183	367
Huron	15	0	181	1	0	0	10	2	21	0	114	1	212	518
Ingham	67	0	951	3	2	0	75	12	84	2	391	3	1112	340
Ionia	1	0	164	1	0	0	10	2	26	1	202	2	200	255
Jackson	28	0	460	1	0	0	16	2	69	1	106	1	545	282
Kalamazoo	22	0	777	2	4	1	27	4	119	2	208	2	927	323
Kent	120	0	1763	6	36	8	43	7	490	10	351	3	2332	297
Lapeer	15	0	238	1	2	0	11	2	28	1	96	1	279	257
Lenawee	15	0	342	1	6	1	0	0	67	1	567	5	415	336
Livingston	6	0	392	1	11	2	12	2	56	1	122	1	471	221
LMAS	12	0	287	1	3	1	2	0	7	0	155	1	299	778
Macomb	163	0	2349	8	27	6	14	2	394	8	398	3	2784	286
Marquette	0	0	270	1	0	0	5	1	20	0	111	1	295	416
Midland	0	0	260	1	2	0	15	2	16	0	139	1	293	307
Mid-Michigan	42	0	509	2	0	0	30	5	83	2	250	2	622	291
Monroe	47	0	473	2	1	0	40	6	46	1	165	1	560	310
Muskegon	29	0	546	2	15	3	29	4	126	3	184	2	716	313
Northwest	2	0	640	2	3	1	6	1	39	1	196	2	688	587
Oakland	79	6	3801	12	123	27	6	1	745	15	1,541	13	4675	313
Ottawa	49	0	534	2	0	0	0	0	152	3	191	2	686	237
Saginaw	66	0	683	2	2	0	3	0	145	3	605	5	833	327
Sanilac	0	0	152	0	1	0	7	1	19	0	53	0	179	339
Shiawassee	2	0	196	1	0	0	13	2	18	0	68	1	227	268
St. Clair	28	0	496	2	2	0	6	1	98	2	213	2	602	290
Tuscola	18	0	159	1	0	0	6	1	21	0	105	1	186	271
VanBuren-Cass	0	0	392	1	1	0	7	1	34	1	190	2	434	301
Washtenaw	57	0	1111	4	30	7	16	2	271	5	550	5	1428	328
Wayne	451	0	3444	11	37	8	14	2	567	11	598	5	4062	309
Western UP	26	0	400	1	0	0	2	0	6	0	180	2	408	563
Totals	1,636	7	31,168	XXX	459	XXX	645	XXX	5,015	XXX	11,575	XXX	37,287	XXX
Average	36	0	678	XXX	10	XXX	14	XXX	109	XXX	252	XXX	811	355
Median	14	0	412	XXX	2	XXX	10	XXX	52	XXX	187	XXX	453	323
Minimum	0	0	127	0	0	0	0	0	3	0	25	0	179	154
Maximum	451	6	3,801	12	123	27	75	12	745	15	1,541	13	4,675	778

Appendix III - Draft

FY 2004/05- Program Staffing – Program Revenue

Michigan Local Health Department Quarterly Reports Summary 2005															
	IMPORTANT FACTOR IV STAFFING							FINANCIAL							Population*
	14. Total number of FTE's assigned to the food program in the following areas: plan review, supervision, coordination, clerical and other food	15. Total number of FTE's assigned to conduct food establishment inspections (all types)	Total FTE's	Minimum Staffing (Per FDA Rec.)	Recommended Staffing (Per FDA)	Average Number of Inspections per FTE Assigned to Conduct Food Establishment Inspections	Fees Collected (budgeted)	Local Tax Dollars (budgeted)	LPHO Dollars (budgeted)	Total Program Revenue (budgeted)	Program Dollars per Licensed Establishment	Program Dollars per FTE	Program Dollars per Citizen		
Allegan	0.90	1.90	2.8	2.0	2.8	434	80,000	81,873	89,185	251,058	644	89,664	2.38	105,366	
BEDHD	3.20	1.30	4.5	3.3	4.6	1,117	154,531	120,571	129,927	405,029	704	90,006	2.43	166,427	
Bay	3.00	3.00	6	2.4	3.3	292	85,000	169,558	93,481	348,039	804	58,007	3.18	109,480	
Benzie-Leelanau	0.90	0.50	1.4	1.3	1.7	1,316	56,993	41,416	41,974	140,383	743	100,274	3.54	39,629	
Berrien	1.00	4.50	5.5	4.2	5.8	387	0	138,894	157,384	296,278	412	53,869	1.82	163,125	
BHSJ	1.00	4.00	5	3.7	5.2	430	184,000	82,128	132,203	398,331	601	79,666	2.54	156,878	
Calhoun	1.30	3.50	4.8	3.1	4.4	449	204,275	138,750	184,678	527,703	904	109,938	3.79	139,067	
CMDHD	2.50	1.50	4	2.3	3.1	1,934	212,901	149,228	117,101	479,230	1,439	119,808	2.51	190,757	
Chippewa	1.01	1.13	2.14	1.1	1.5	415	59,330	84,482	40,208	184,020	907	85,991	4.74	38,791	
Delta-Menominee	1.90	1.40	3.3	1.9	2.5	545	80,000	3,655	52,971	136,626	466	41,402	2.15	63,554	
Detroit City	6.00	13.00	19	11.8	16.9	412	855,500	759,549	522,380	2,137,429	933	112,496	2.37	900,198	
Dickinson-Iron	1.33	1.05	2.38	1.1	1.6	440	64,000	4,448	51,138	119,586	531	50,246	2.99	39,932	
DHD #2	0.87	1.00	1.87	2.2	3.0	882	87,080	110,851	81,978	279,909	807	149,684	4.01	69,786	
DHD #4	1.90	1.00	2.9	2.2	3.1	732	115,000	89,459	81,467	285,926	671	98,595	3.45	82,832	
DHD #10	0.50	5.50	6	6.4	8.8	441	220,860	297,385	219,452	737,697	691	122,950	2.78	265,600	
Genesee	5.00	10.00	15	7.9	11.3	320	550,400	592,766	464,911	1,608,077	1,064	107,205	3.62	443,947	
Grand Traverse	0.40	2.40	2.8	1.8	2.7	323	127,800	58,894	76,178	262,872	683	93,883	3.18	82,752	
Holland City	0.80	1.00	1.8	1.1	1.5	656	0	0	0	0	0	0	0.00	34,606	
Huron	1.33	1.03	2.36	1.3	1.8	594	67,160	28,829	34,218	130,207	614	55,172	3.73	34,948	
Ingham	3.00	8.40	11.4	6.2	8.7	304	441,827	231,852	218,193	891,872	802	78,234	3.18	280,073	
Ionia	0.60	0.40	1	1.6	2.0	1,465	46,656	31,489	22,171	100,316	502	100,316	1.56	64,378	
Jackson	1.70	2.50	4.2	2.8	4.0	416	173,550	82,877	123,392	379,819	697	90,433	2.33	162,973	
Kalamazoo	2.40	4.00	6.4	4.8	6.9	482	234,400	26,664	215,263	476,327	514	74,426	1.98	240,724	
Kent	3.00	9.00	12	11.5	16.7	635	578,069	36,791	350,443	965,303	414	80,442	1.63	593,898	
Lapeer	1.50	2.00	3.5	1.6	2.2	362	72,750	64,415	76,257	213,422	765	60,978	2.31	92,510	
Lenawee	2.90	0.80	3.7	3.7	4.7	1,713	122,300	18,655	105,825	246,780	595	66,697	2.42	101,768	
Livingston	1.00	2.50	3.5	2.5	3.5	392	215,680	48,982	118,532	383,194	814	109,484	2.16	177,538	
LMAS	2.07	0.38	2.45	1.8	2.5	1,997	106,000	0	125,699	231,699	775	94,571	6.28	36,867	
Macomb	6.00	15.00	21	13.7	19.9	422	474,025	817,378	594,041	1,885,444	677	89,783	2.29	822,660	
Marquette	0.80	1.30	2.1	1.7	2.3	632	100,000	24,293	60,678	184,971	627	88,081	2.85	64,874	
Midland	1.24	1.33	2.57	1.8	2.4	641	47,771	64,140	70,524	182,435	623	70,986	2.16	84,615	
Mid-Michigan	1.70	3.80	5.5	3.6	5.0	463	119,732	222,226	134,048	476,006	765	86,547	2.72	174,823	
Monroe	0.40	1.30	1.7	3.0	4.3	1,068	113,750	144,401	79,850	338,001	604	198,824	2.22	152,552	
Muskegon	1.75	4.00	5.75	3.8	5.4	314	215,695	67,861	99,006	382,562	534	66,533	2.19	174,401	
Northwest	2.00	3.00	5	3.7	5.2	478	190,000	116,560	88,440	395,000	574	79,000	3.63	108,955	
Oakland	16.10	25.50	41.6	25.9	36.3	648	572,415	1,036,112	853,593	2,462,120	527	59,186	2.03	1,213,339	
Ottawa	2.40	3.30	5.7	3.7	5.2	612	171,840	186,408	143,339	501,587	731	87,998	2.23	224,856	
Saginaw	2.80	2.60	5.4	5.7	7.6	876	184,400	99,278	266,664	550,342	661	101,915	2.63	209,062	
Sanilac	1.00	1.00	2	1.0	1.4	316	32,000	7,764	44,726	84,490	472	42,245	1.88	44,828	
Shiawassee	0.60	0.80	1.4	1.2	1.7	430	50,850	28,993	66,992	146,835	647	104,882	2.01	73,125	
St. Clair	2.00	3.00	5	3.4	4.7	471	102,735	178,197	167,906	448,838	746	89,768	2.63	170,916	
Tuscola	0.44	0.73	1.17	1.2	1.6	862	43,970	14,278	42,481	100,729	542	86,093	1.72	58,646	
VanBuren-Cass	1.40	1.80	3.2	2.6	3.5	501	111,625	67,973	96,459	276,057	636	86,268	2.12	130,302	
Washtenaw	3.20	8.20	11.4	8.2	11.4	394	531,670	77,802	273,025	882,497	618	77,412	2.60	339,191	
Wayne	10.00	13.50	23.5	20.0	29.1	797	1,083,300	2,398,448	1,091,100	4,572,848	1,126	194,589	4.10	1,116,004	
Western UP	2.67	1.26	3.93	2.4	3.3	776	100,000	17,542	101,867	219,409	538	55,829	3.09	71,067	
Totals	109.51	180.11	290	204	287	XXX	9,441,840	9,064,115	8,201,348	26,707,303	31,140	XXX	XX	10,112,620	
Average	2.38	3.92	6	4	6	538	205,257	197,046	178,290	580,594	677	92,204	2.70	219,840	
Median	1.70	2.20	4	3	4	XXX	117,366	82,001	103,846	343,020	654	XXX	2.47	134,685	
Minimum	0.40	0.38	1	1	1	292	0	0	0	0	0	0	0.00	34,606	
Maximum	16.10	25.50	42	26	36	1,997	1,083,300	2,398,448	1,091,100	4,572,848	1,439	198,824	6.28	1,213,339	

*Source: Population Division, US Census Bureau

Appendix IV - Draft

FY 2004/05 Foodborne Illness Outbreaks – LHD Table

Foodborne Illness Outbreaks by Local Health Department

Jurisdiction	FBI Outbreaks	% of Total FBIs	% of Total MI FSEs	Population	% of Total Population	Reports Filed w/ State	Missing Reports
Kent	31	17.6%	5.7%	593,898	5.9%	31	0
Oakland	29	16.5%	12.2%	1,213,339	12.0%	24	5
Macomb	14	8.0%	7.5%	822,660	8.1%	14	0
Detroit	12	6.8%	5.6%	900,198	8.9%	5	7
Wayne	12	6.8%	11.0%	1,116,004	11.0%	9	3
Genesee	11	6.3%	4.2%	443,947	4.4%	11	0
Washtenaw	8	4.5%	3.6%	339,191	3.4%	8	0
DHD #10	6	3.4%	3.1%	265,600	2.6%	6	0
Livingston	6	3.4%	1.3%	177,538	1.8%	6	0
Calhoun	5	2.8%	1.6%	139,067	1.4%	4	1
Berrien	4	2.3%	2.0%	163,125	1.6%	4	0
Ingham	3	1.7%	3.1%	280,073	2.8%	3	0
Ottawa	3	1.7%	1.7%	224,856	2.2%	3	0
Br-Hills-StJoe	2	1.1%	1.6%	156,878	1.6%	2	0
Central MI	2	1.1%	0.9%	190,757	1.9%	2	0
Jackson	2	1.1%	1.5%	162,973	1.6%	2	0
Lapeer	2	1.1%	0.8%	92,510	0.9%	2	0
Marquette	2	1.1%	0.9%	64,874	0.6%	2	0
Mid-MI DHD	2	1.1%	1.6%	174,823	1.7%	2	0
Saginaw	2	1.1%	2.2%	209,062	2.1%	2	0
St. Clair	2	1.1%	1.6%	170,916	1.7%	2	0
VanBuren-Cass	2	1.1%	1.3%	130,302	1.3%	2	0
Bay	1	0.6%	1.3%	109,480	1.1%	1	0
Benzie-Leelanau	1	0.6%	0.6%	39,629	0.4%	1	0
Chippewa	1	0.6%	0.6%	38,791	0.4%	0	1
Delta-Menominee	1	0.6%	0.9%	63,554	0.6%	1	0
DHD #2	1	0.6%	1.1%	69,786	0.7%	1	0
Dickinson-Iron	1	0.6%	0.7%	39,932	0.4%	1	0
Grand Traverse	1	0.6%	1.0%	82,752	0.8%	1	0
Ionia	1	0.6%	0.5%	64,378	0.6%	1	0
Kalamazoo	1	0.6%	2.5%	240,724	2.4%	1	0
Lenawee	1	0.6%	1.1%	101,768	1.0%	1	0
Midland	1	0.6%	0.8%	84,615	0.8%	1	0
Monroe	1	0.6%	1.5%	152,552	1.5%	1	0
Muskegon	1	0.6%	1.8%	174,401	1.7%	1	0
Northwest MI	1	0.6%	2.1%	108,955	1.1%	1	0
	176	100.0%				159	17
Estimated Michigan Population (2004 estimate) = 10,112,620 (Source: Population Division, U.S. Census Bureau)							
Michigan Foodservice Establishments = 31,168							
NOTE: The number of reported illnesses cannot be interpreted as indicating the relative risk or safety of food in any jurisdiction.							

Appendix V- Draft

FY 2004/05 Foodborne Illness Outbreaks- Risk Factor 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 Bldg, 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.