Michigan Department of Agriculture and Rural Development (MDARD)
Michigan Department of Health and Human Services (MDHHS)

Food Specimen Collection and Testing Tips
Bacterial Pathogens/Toxins

Laboratory identification of a bacterial pathogen or related toxin in a food item can support the epidemiologic data collected during a foodborne illness investigation and facilitate rapid control measures.

Testing Laboratories

MDHHS Bureau of Laboratories (BOL) in Lansing (www.michigan.gov/mdhhslab) typically performs testing on foods directly associated with a foodborne outbreak, such as leftover foods, prepared foods from an implicated restaurant or venue, and **opened packages** of food from a patient home.

MDARD Geagley Laboratory in Lansing (http://www.michigan.gov/mdard) can typically perform selected testing of **unopened foods** collected from a store, warehouse, or restaurant.

Foods can be tested for the following pathogens (see flow chart Appendix A):

Bacillus cereus (MDHHS only)	*E. coli*, Shiga-toxin producing	*Shigella*
Campylobacter (MDHHS only)	*Listeria monocytogenes*	*Staphylococcus aureus*
Clostridium botulinum (MDHHS only)	*Scombrotoxin* (MDARD only)	*Yersinia enterocolitica* (MDHHS only)
Clostridium perfringens (MDHHS only)	*Salmonella*	

Negative test results are typically available in four to six days. If initial testing is positive and if toxin testing and/or plate counts are required, final results can take up to an additional four days. *C. botulinum* testing requires additional time.

Approval for Testing

All testing for foodborne illness MUST be arranged with MDHHS Surveillance and Infectious Disease Epidemiology (SIDE) Section **(517) 335-8165** prior to specimen transport.

For testing to be approved, there should be a working hypothesis regarding the food(s) and causal agent(s) that are suspected. The hypothesis should be based on incubation time, clinical symptoms, illness duration, attack rates, known reservoirs, or other recent outbreaks and any observed violations in food handling, processing, temperature, storage, or other relevant information. ***If more than one food is suspected, it is necessary to prioritize which food to test first.***

Initial Steps -- *Save and Document Available Foods*

At the start of a foodborne illness investigation it is important to collect or at least securely hold available foods (solid and/or liquid) should testing of these products be needed. Samples may be stored at the local health department before shipping to a lab.

If a food item of interest is identified, collect preliminary information to help determine if sampling is warranted. This includes **product identifiers** (e.g. brand, size, lot codes, best/sell by dates, etc.), **purchase information** (date, location, shopper card number if available) and **photos**.

General Guidelines - Food Sample Collection	

Develop Plan:	• Identify priorities, techniques, roles, responsibilities, and necessary equipment to determine when, what, and how to sample
	  ○ Allow for enough time at the sample site
	• Utilize menu and data from epidemiologic interviews to identify the most suspect foods
	  ○ Keep samples secure and ensure prompt transport to the lab

What to sample:	• Sample leftovers of food(s) eaten
	• Intact packages of food item(s) of interest
	• If leftovers are not available, try to sample food(s) prepared the same day/meal, such as:
	  ○ Discarded foods or containers (*check storage or garbage areas*)
	  ○ Bulk storage containers of suspect foods
	  ○ Table scrapings or food residues from utensils or equipment
	  ○ Ingredients or raw items used in the suspect food
	• Foods known to be associated with the pathogen in question

Obtain Photos	
Photo Tips:	• Photos should clearly show the overall contents, packaging, labeling, weight or volume, markings, 'sell-by-date', production date, code numbers, establishment numbers/seals • Take photos from multiple angles/sides to capture all information and markings • Photos of the food item should be taken at the location where you obtained it (refrigerator, freezer, buffet line, etc.) • Avoid blurriness, glare, shadows, reflections and show the item scale and dimensions
Samples should be ***Aseptic, Representative, and an Adequate Amount***	
Aseptic Sampling: (does not increase microbial load)	
Aseptic Tips:	• Wash hands and don sterile gloves. Use sterile implements to aseptically transfer food to a sterile container or sterile whirl-pak bag • Avoid contact with sample, non-sterile equipment, or contaminated items. Avoid touching sterile surfaces of sampling utensils and the inside of sterile container • Only fill whirl-pak bags 2/3rd full
Representative Sample Collection	
All Items:	• Submit items in original packaging if possible
Large Items:	• Collect whole item if possible, **OR** • Sample geometric center and several other locations throughout product
Meal Components	• Package each different food item separately • Do not comingle different items in the same sample
Food Types	
Solids (i.e. roasts, casseroles):	• For large items, separate portions with a sterile utensil and transfer to sterile container • Ensure that the sample is representative • Sample size minimum: 50-100g (4 oz)
Liquids (i.e. beverages, gravy, soup): **Excludes water samples*	• Thoroughly stir, shake, or mix to obtain a homogenous sample • Wearing sterile gloves pour the liquid into a sterile leakproof container • If necessary, a sterile ladle or scoop may also be used to sample a bulk liquid • Sample size minimum: 50-100g (4 oz)
Packaged food:	• If possible, submit an unopened package processed in the same lot as the suspect food • Alternately, obtain a sample of suspected food from the same package

Laboratory Submission Tips

Labeling, Documentation, & Transportation of Samples	

Label and Secure:	• Tightly close and seal the sample (avoid puncturing bag with wire closures)
	• Leaking samples will not be tested
	  ○ Secure caps on containers with tape
	  ○ Place containers in zip-top bag to prevent leaking
	• Label information should match that put on the test requisition form
	  ○ Include collection site, date of collection, food type, and any other unique identifiers

Document:	• Accurately and completely fill out test requisition form (include):
	  ○ Submitting agency, date collected, food type, collection site (patient or facility name), type of testing requested (organism(s) or toxins)
	  ○ A **pre-arranged Outbreak Identifier** must be included on the test requisition form
	  ○ A test requisition must be filled out completely for each specimen submitted. Use the DCH-0583 Microbiology/Virology Test Requisition form or DCH-1052 for multiple samples. Forms available at: www.michigan.gov/mdhhslab

Transport:	• Maintain storage and transportation temperatures as close to collection conditions as possible (e.g. frozen stays frozen, cold stays cold) • Keep product temperature constant during transportation by placing into a Styrofoam cooler with adequate cold packs • Ensure prompt delivery (or express-ship) of samples and reports to lab within 24 hours • Notify MDHHS of approximate **arrival time** and **shipping method** of specimens. ○ Frozen foods cannot be shipped over a weekend
Chain of Custody	
Chain of Custody:	• Use chain of custody form to document sample collection, location, condition, storage, handling, and transportation details https://www.michigan.gov/documents/mdch/Environmental_Chain_of_Custody_Form_398513_7.pdf • Record all sample identifiers • Complete in detail who obtained, delivered, tested, or disposed of samples
Evidence Tape	
Evidence Tape	• It is preferred that samples have evidence tape applied to connect the top of the specimen cup to the bottom or seal the 2 edges of a bag. If many samples are collected at the same time the lid of the outer packaging (case/cooler/box) should have the evidence tape applied to the seam at a minimum.

For additional resources, forms and information please visit www.michigan.gov/CDINFO.

For specimen collection and testing pre-approval, questions, or consultation:
Contact MDHHS Communicable Disease Division at 517-335-8165

To consult regarding specimen collection or transport:
Contact MDHHS Bureau of Laboratories at 517-335-8067
MDARD Geagley Laboratory at 517-284-0500