Use of Shopper Records in Foodborne Outbreak Investigations





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2022 Michigan Communicable Disease Conference

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Shopper/Consumer Records - a priceless resource

- Patient exposures not always straightforward
- Interviews may not be enough



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- Shopper/consumer purchase records can be used to identify exposures
 - Help generate hypotheses
 - Set traceback for suspect food vehicles



Shopper record

Any record that provides information about a specific shopper's food purchases.



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What reportable conditions should shopper information be gathered for?

- Salmonella
- Shiga-toxin producing E. Coli (STEC)
- Listeria
- Cyclospora
- Hepatitis A (foodborne suspect only)
- Any case where the MDSS form requests it



How is the data used?





Role of Investigators

Undertake scientifically sound investigations to

- Implicate specific food item
- Rule out end user contamination
- Interview cases for product details and where they purchased the food (e.g., receipts, card information, etc)
- Collect paperwork (e.g., receipts or other purchase records) from food establishments or consumers
- Work with regulatory partners who can trace further up the supply chain as necessary



Regulator Informational Needs

- Suspected food(s), if any
- Onset date
- Suspected meal /purchase dates if available
- Defined time period of interest –How far do we go back?
- Available purchase records, i.e. receipts, statements
- Stores/restaurants of interest-locations and chain info, if available
- Card numbers –shopper card or credit/debit numbers
- Verification of consumer **PERMISSION** to obtain the information



Requests to Industry





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Example consumer purchase records

А	В	С	D	E	F		G	H		J
OYALTY_CARD_NU	TRANSACTION_DATE	GTIN_ZERO_PAD	ITEM_DESCRIPTION	ITEM_SIZE	PRICE_WITH	I_CAR	UNITS	POUNDS	GALLONS	TRANSACT
23456789	4/23/2021 0:00	00003100000738	BANQ BACKYARD BBQ MEAL	10.45 OZ	\$	1.25	1	. 0	0	########
	1/1/2021 0:00	00003100010102	2 BANQ BEEF POT PIE	7 OZ	\$	2.00	2	. 0	0	########
	1/4/2021 0:00	00003100010101	I BANQ CHICKEN POT PIE	7 OZ	\$	4.00	4	0	0	########
	1/5/2021 0:00	00003100010976	BANQ CHKN FRIED CHKN MEAL	10.1 OZ	\$	1.25	1	. 0	0	########
	1/5/2021 0:00	00003100000731	I BANQ MEATLOAF MEAL	11.88 OZ	\$	1.25	1	. 0	0	########
	1/8/2021 0:00	00003100012613	BANQ MGA BWL CHCKN FAJITA	14 OZ	\$	2.89	1	. 0	0	########
	1/10/2021 0:00	00003100012611	I BANQ MGA BWL CKN FRD BF	14 OZ	\$	2.89	1	. 0	0	########
	1/11/2021 0:00	00003100000730	BANQ SALISBURY STEAK MEAL	11.88 OZ	\$	1.25	1	. 0	0	########
	1/11/2021 0:00	00003100000737	7 BANQ TURKEY MEAL	10 OZ	\$	1.25	1	. 0	0	#########
	A 14 A 12024 0.00	000000000000000000000000000000000000000		44.07	A	F 70	-	0	0	



Why are there no records for item purchases?

- •Cash
- •Different payment method
- •Did not use shopper card or used different one
- •Food consumed was provided by unidentified person
- •Different retailer



What does MDARD do with these records?

- Thank the operator for their response
- Are they for the person identified?
- Do the records fit into time frame of interest?
- Review each record in detail to look for all potential purchases of implicated foods, (types, brands, description, etc.)

- Gaps? -
 - Ex. History shows bagged lettuce every two weeks for six weeks
 - Sudden gap in that pattern-did they buy it someplace else we don't know about?
- Share records with MDHHS- upload into MDSS
- Redact and share with federal partners
- May re-contact industry to ask questions
- If product is verified, initiate traceback



Case Study 1: Salmonella Weltevreden in Cooked Frozen Shrimp



CASE STUDY 1: Salmonella Weltevreden in Cooked Frozen Shrimp

- Jan 26 –Company A imported frozen shrimp sample contaminated with S. Weltevreden- no illnesses
- March FDA refused admission into US; issued import alert
- April Three clinical isolates highly genetically related to import sample.
- June-Three clinical cases are identified that match outbreak strain (no cases in Michigan). Company A recalls specific (8 brands) after more cases identified.





Michigan Joins the Investigation

- Aug 5 Michigan notified of two new cases that were highly genetically related to outbreak strain.
- 9 cases (MI-2); Onsets 2/26-7/21
 - ≻All cases interviewed identified eating shrimp before onset (7)
 - Did either case report shrimp? (Both had completed initial interviews)
 - Case 1-reported possibly purchasing from one of two retailers
 - Case 2-didn't report during initial interview- was unable to be recontacted
 - Where do they shop?
 - Case 1- Reported purchasing frozen cooked shrimp from either Retailer C or Retailer S, but couldn't quite remember-gave permission to pull shopper card information for both. Reported additional shopping locations.
 - Case 2- Reported only buying groceries from a local store, Retailer K, but was unable to be recontacted for more details.



Data from Retailer S

- At the beginning of this investigation, minimal established relationship with retailer
- Navigation of policies and procedures
- Retailer was able to supplement non-complete information from case investigation demographics
- Extremely quick turnaround time
- No shrimp on shopper record



Data from Retailer C

- With prior established retailer relationships- was simple to pull records
- Pulled six months worth of records for anything frozen 1/1/2021-06/13/2021
- Retailer was able to share shopping records within 24 hours of request
- Pre-cooked frozen shrimp was present on the purchase history
 - Purchase date also available, which allowed for traceback



Case Study 2: *Listeria monocytogenes* in Enoki Mushrooms



CASE STUDY 2: Listeria monocytogenes in Enoki Mushrooms

- In February 2020, CDC reopened a cluster of Listeria monocytogenes with clinical cases with onsets from 2016-2019
 - New environmental samples from Canada isolated LM linked to clinical cases by WGS
 - Pathogen was found in packaged enoki mushrooms
 - 36 clinical cases in US, 6 cases in Canada.
 - 17 states
 - 31 hospitalizations
 - 4 deaths
 - One Michigan case
 - Reported consuming enoki mushrooms, among other types of specialty mushrooms





Case Study 2: Listeria monocytogenes in Enoki Mushrooms

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- One Michigan case from March of 2018
- Case ate multiple uncommon mushroom types during exposure period
- Receipts were provided during interview and kept on file in Michigan Disease Surveillance System (MDSS).

MDHHS Michigan Disease Surveillance System



Sampling and Findings

- MDHHS and CDC requested visit to firm for record collection
 - South Region Food inspector collected invoices, in addition to samples of multiple types of mushrooms, focusing on enoki.
 - Upon testing, both enoki mushroom samples came back Cannot Rule Out (CRO) for Listeria species and subsequently for *Listeria monocytogenes*.
 - South Region went to seize remaining product, none remained, sampled new lot, seized new lot
- MDARD's Geagley Lab and MDHHS's Bureau of Laboratories turned lab results around quickly revealing WGS matches into cluster code.
- Findings resulted in a product recall and vehicle identification for a multi-year, multistate cluster of illness



CASE STUDY: Findings, Results and Takeaways

- Enteric disease investigators play a critical role in collection of this data-
 - YOU CAN MAKE ALL THE DIFFERENCE!

May we have permission to retrieve purchases based on your shopper/member card information? This information may be shared with other public health officials to help with this outbreak investigation, and will be kept confidential.								
Store Name	Name Associated with Account	Shopper Card Number						



Consumer Purchase Resources

<u>Leveraging Good Purchase History to Solve</u> <u>Foodborne Outbreaks – Association of Food and</u> <u>Drug Officials (afdo.org)</u>



Association of Food and Drug Officials

Many perspectives, one voice, since 1896.



SHOPPER **HISTORY: Best Practices for Use during Foodborne Illness Investigations** October 2020



State of Michigan – Department of Health and Human Services

The following provides the State with the authority to obtain records and documents necessary for the determination of consumer food purchases during investigation of foodborne illnesses within their jurisdiction. Questions regarding specific situations, the documents that can be requested, or the statutory citations listed should be directed to the authorized State agency. You may access contact information for the state agency on the Directory of State and Local Officials webpage at: http://dslo.afdo.org

Michigan Administrative Code

§ R 325.174 Investigation of diseases, infections, epidemics, and situations with potential for causing diseases.

Rule 4. (1) The department or the local health department that has jurisdiction where an individual who has a reported condition resides or where an illness or infection is being or may be spread shall initiate an investigation as necessary. (2) An investigator who presents official identification of the local health department or the department shall promptly be provided with medical, epidemiologic, and other information pertaining to any of the following:

(a) Individuals who have designated conditions or other conditions of public health significance.

(b) Individuals, whether ill or well, who are part of a group in which an unusual occurrence, outbreak, or epidemic has occurred.

(c) Individuals who are not known to have a designated condition but whose medical or





Thank You!

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