

S. Heidelberg Outbreak in NYC: A Common PFGE Pattern within a Distinct Community



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Initial Cluster Detection

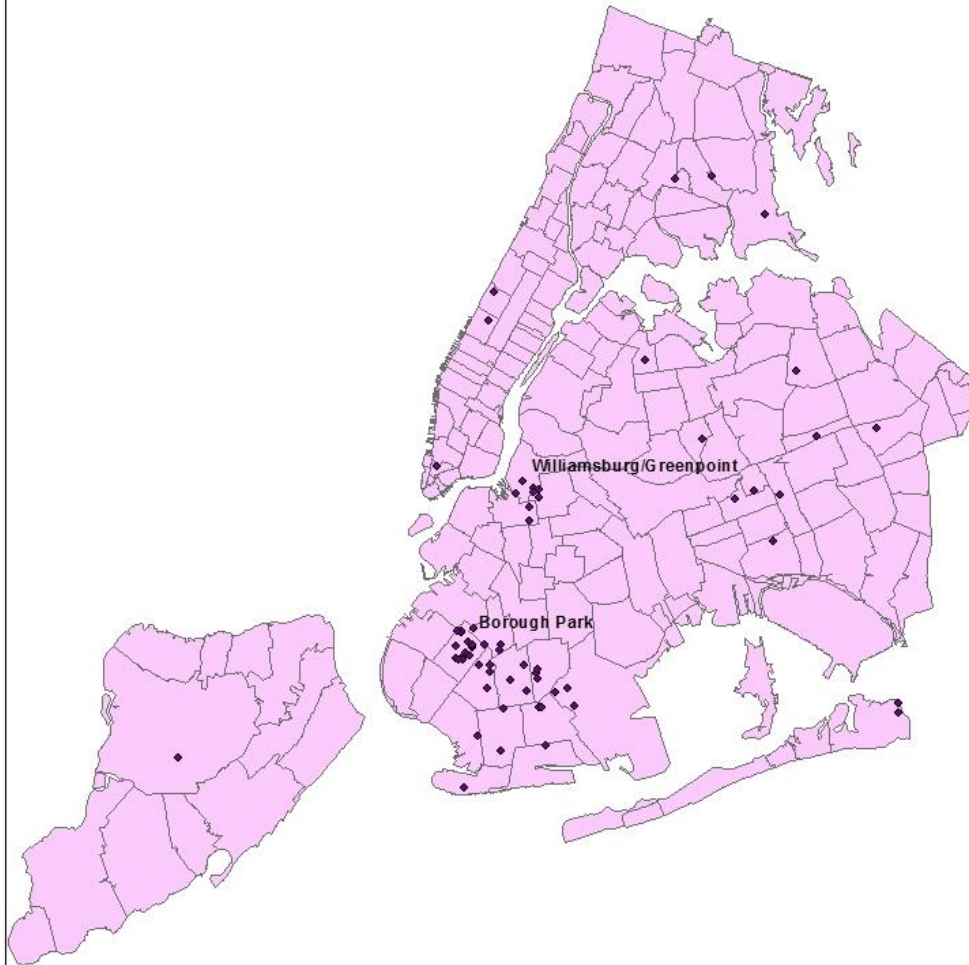


- ✧ July 6, 2011-NJDOH Epi contacted NYSDOH and NYCDOHMH about an increase in S. Heidelberg specifically among their Observant (Ultra Orthodox) Jewish Community
- ✧ NYCDOHMH reviewed our routine serotype analysis and compared to the previous years
- ✧ Pulled questionnaires for S. Heidelberg cases interviewed by our FoodCORE funded Team Salmonella student interviewers

S. Heidelberg demographics past and present

- From May 1-July 1, 2010 there were 20 S. Heidelberg cases compared to 14 during the same time in 2011.
- Geographic distribution
 - 2010 cases scattered throughout NYC
 - 2011 cases 12/14 in the same two Brooklyn neighborhoods
- Demographics of cases
 - 2010 cases had various race/ethnicities and languages
 - 2011 cases 13/14 either ate a Kosher diet, spoke Yiddish at home or describe themselves as Jewish

Location of Salmonella Heidelberg Cases During 2011 Outbreak in NYC



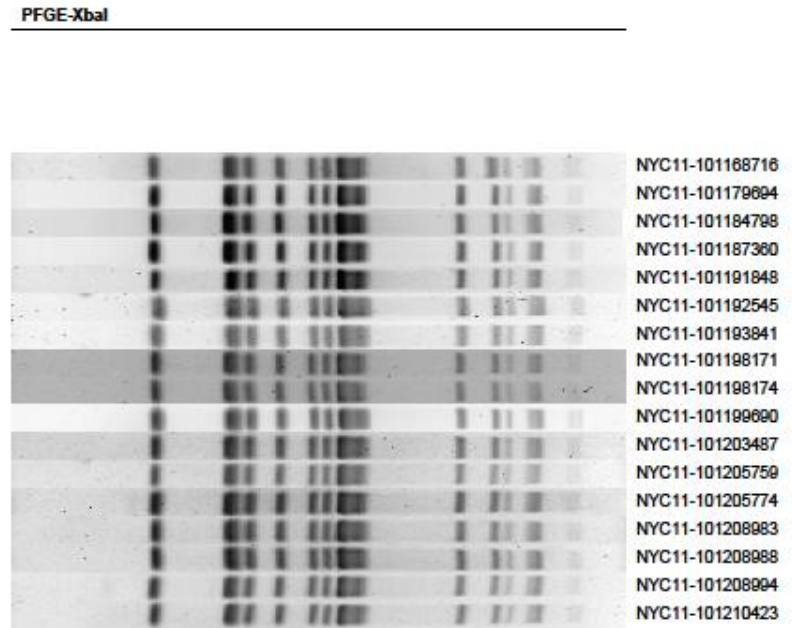
n=70

Cases Diagnosed April 2011-November 2011

PFGE results



- ☞ All the *S. Heidelberg*s in NYC matched as pattern JF6X01.0022
- ☞ As this is the most common Heidelberg pattern, PFGE was not the most useful tool for this investigation



Food exposures for *S. Heidelberg* cases in 2011

Food	NJ- 18 cases	NYC-19 cases	FoodNet Pop
Chicken	89%	90%	69%
Deli Meats	78%	17%	n/a
Cucumber	72%	83%	47%
Eggs	65%	63%	87%
Tomatoes	56%	61%	n/a
Watermelon	56%	52%	23%

The investigation goes national and international



- ❧ In August 2011 a multistate investigation was initiated.
 - ❧ Asked CDC about any increases of *S. Heidelberg* in Montreal, England or Israel, as previous outbreaks have been seen in these areas as well (1994 Bamba snacks)
- ❧ In addition, a Yeshiva (school) in Philadelphia had a *S. Heidelberg* JF6X01.0022 cluster
 - ❧ A specific exposure was not identified

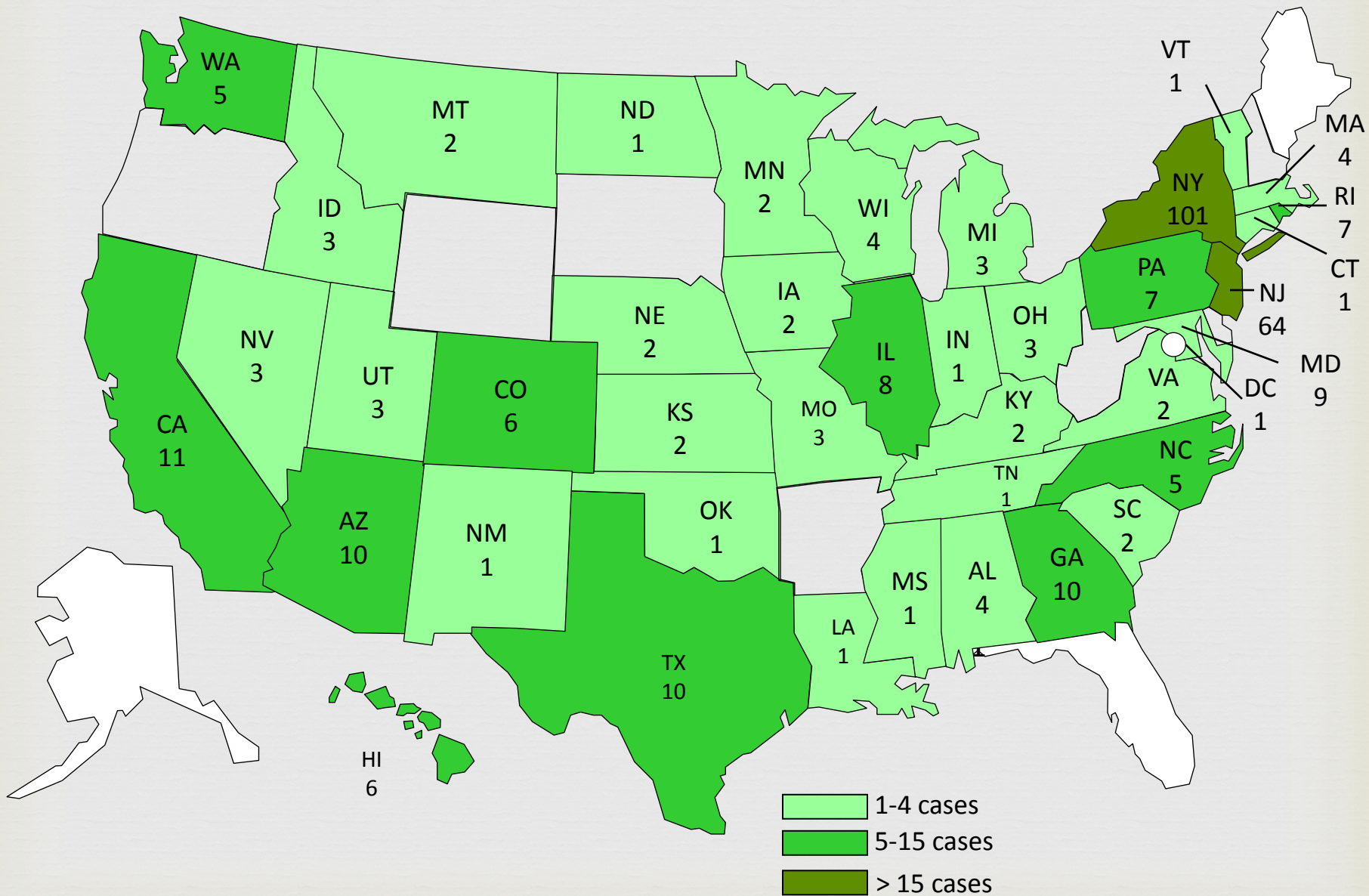
***Salmonella* Heidelberg 1108NJJF6-1 cluster, as of November 4, 2011**

State	Count	State	Count
AL	4	MT	2
AZ	10	NC	5
CA	11	ND	1
CO	6	NE	2
CT	1	NJ	64
DC	1	NM	1
GA	10	NV	3
HI	6	NY	101
IA	2	OH	3
ID	3	OK	1
IL	8	PA	7
IN	1	RI	7
KS	2	SC	2
KY	2	TN	1
MA	4	TX	10
MD	9	UT	3
MI	3	VT	1
MN	2	WA	5
MO	3	WI	4
MS	1		
Grand Total 312			

Total Case Count

- Confirmed Case Definition:
 - illness in a patient with *Salmonella* Heidelberg infection,
 - with PulseNet upload dates on April 1, 2011 - November 3, 2011, and
 - with isolate matching PFGE *Xba*I pattern JF6X01.0022 and PFGE *Bln*I pattern JF6A26.0001 or pending.
- 312 cases in 39 states
- Age: Median Age= 16 (Range < 1 to 97)
- Sex: 47% Female
- Onset Dates (includes Estimation): Feb 5, 2011 - October 20, 2011

Geographic Distribution of *Salmonella* Heidelberg Cluster 1108JJF6-1 as of 11/4/11 (n=312)



Getting to know the community



- ❧ Enlisted help from a colleague with personal knowledge about this specific community
 - ❧ She helped conduct interviews
 - ❧ Answered questions about Kosher diets and practices

- ❧ Visited grocery stores in the neighborhoods to look for foods:
 - ❧ Not on our questionnaire
 - ❧ Only found in this neighborhood and not in other stores with Kosher products
 - ❧ Produced or distributed primarily in NJ or NY

Red Herrings and other foods that led us astray



❧ Fish

- ❧ Haddock samples positive for S. Heidelberg from China upload by FDA on July 28

❧ Eggs

- ❧ 2000 SE investigation of 68 cases related to gefilte fish made with raw eggs

❧ Milk

- ❧ Golden Flow was a common type of “Super” Kosher milk consumed by many in this community

❧ Cucumbers

- ❧ At one point almost 100% of cases had consumed this

A new contender enters...



- ❧ In October, two Team Salmonella students noticed that three new cases who were part of a slightly different Jewish community mentioned consuming broiled chicken livers.
 - ❧ Not directly asked on our questionnaire or supplemental
 - ❧ Some confessed that they had not cooked it long enough
 - ❧ Two specific stores were mentioned by these cases
- ❧ Our NYS Ag and Markets colleagues went to the stores to collect whole livers and liver spreads for testing and to inquire about distribution and preparation.



11B- 9801

BROILED CHICKEN LIVER

PREPARED AND SALTED
KING OF QUEENS
NET WT. LBS. 001552
PRICE PER LB. 0.99
TOTAL PRICE 1.48



6.83

SAFE HANDLING INSTRUCTIONS
ON PRODUCE: ALWAYS WASH PRODUCE THOROUGHLY AND REMOVE ANY DAMAGED OR SOILED PORTIONS.
CAUSE ILLNESS IF THE PRODUCT IS REHANDLED OR COOKED INAPPROPRIATELY.
FOR YOUR PROTECTION, FOLLOW THESE SAFE HANDLING INSTRUCTIONS OR MICROWAVE INSTRUCTIONS.
KEEP REFRIGERATED OR FROZEN. THAW IN REFRIGERATOR OR MICROWAVE.
KEEP RAW MEAT AND POULTRY SEPARATE FROM OTHER FOODS.
WASH WORKING SURFACES (INCLUDING CUTTING BOARDS, UTENSILS, AND KNIVES) THOROUGHLY.
WASH HANDS AFTER TOUCHING RAW MEAT OR POULTRY.
KEEP HOT (SERIAL HOT) REFRIGERATE LEFTOVERS IMMEDIATELY OR DISCARD.

Aron's Kissena farms
6181 ROUTE 208
FARMERS MARKET
SUPPORTED BY VARIOUS ORGANIZATIONS

412

Partially broiled chicken liver – Just a bad idea



- ❧ Product appears to be ready-to-eat
 - ❧ Consumers and retail establishment were only heating up and not cooking thoroughly.
 - ❧ Livers were being turned into chopped liver spreads and sold in grocery stores as a finished product.

- ❧ Instruction problems
 - ❧ “For further thermal processing” is unclear

- ❧ NYS laws in conflict with USDA rules
 - ❧ “Cook to 160 degrees F” should be 165 in NY
 - ❧ Illegal to sell partially cooked poultry products in NY

Meal Mart



גלאט כשר
Glatt Kosher



**BROILED
CHICKEN LIVERS**

COOK THOROUGHLY

02-CLB10

KOSHER MADE
(FOR FURTHER THERMAL PROCESSING)

COOKING INSTRUCTIONS: COOK THOROUGHLY TO 160°F. (SEE SAFE HANDLING INSTRUCTION LABEL)

TOTAL NET WT. 5 LB.



VACUUM PACKED • KEEP REFRIGERATED OR FROZEN
MEAL MART, MASPETH, N.Y. 11378 • CUSTOMER SERVICE 718-804-2000

PFGE matches and a recall



- ❧ Food isolates collected by NYS Ag and Markets had an indistinguishable PFGE pattern from the outbreak
 - ❧ Found in chopped liver spreads and whole livers
- ❧ USDA-FSIS's investigation determined that the “kosher broiled chicken livers” were distributed to NY, NJ, PA, MD, MN, OH, RI, and FL.
- ❧ Alle Processing Corporation/MealMart Company of NYC issues a recall on November 9, 2011
 - ❧ USDA regulated facility in Queens

Analysis



- ❧ Case-case analysis of 56 cases and 1,382 Sal controls found chicken consumption (whole or parts) was significantly associated with illness (OR=5.1)
- ❧ For NYC S. Heidelberg cases, 59% (10/17) non-kosher eaters reported eating chicken compared to 92% (24/26) of kosher eaters (p-value 0.006)
- ❧ Of the cases who reported eating chicken liver and responded to the dietary restriction question, 100% reported eating a kosher diet.

Summary-Investigation



- From April 1 to November 17, there were 190 cases of *Salmonella* Heidelberg with pattern JF6X01.0022
 - 73 NYC, 62 NJ, 36 NYS, 10 PA, 6 MD, 2 OH, 1 MN
- PFGE and epi linked to broiled chicken livers
- Broiled chicken livers appeared to be fully cooked and lacked appropriate cooking instructions
- The company permanently halted all production of partially cooked broiled chicken livers
- USDA reevaluated the labeling language

Conclusions-Investigation



- ❧ Value to having well-trained student interviewers
 - ❧ Faster questionnaire completion sped up our ability to respond to the initial NJ report
 - ❧ Sitting close by or holding weekly meetings to enhance collaboration and brain-storming
 - ❧ Limiting investigation to a few interviewers

- ❧ Consider using a limited case definition when:
 - ❧ The PFGE is very common
 - ❧ The outbreak involves a distinct group, demographic or food preference

Acknowledgements



- ❧ Team Salmonella
- ❧ NYCDOHMH BCD
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- ❧ NJDOH
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- ❧ FDA
- ❧ APHL