

# ***E. coli* O111 Outbreak Associated with Green Cabbage Served at Restaurants in Minnesota and Wisconsin - July, 2014**



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# **Key Components of Foodborne Outbreak Investigations in Minnesota**

- **Mandatory isolate submission and real-time pulsed-field gel electrophoresis (PFGE)**
- **Centralized surveillance/investigation of cases**
- **Real-time interviews done with all cases using a detailed questionnaire**
  - **Specific food info, point of sale/service**
- **Iterative cluster investigation model**
- **Ingredient-specific analyses in subclusters**

# **Key Components of Foodborne Outbreak Investigations in Minnesota**

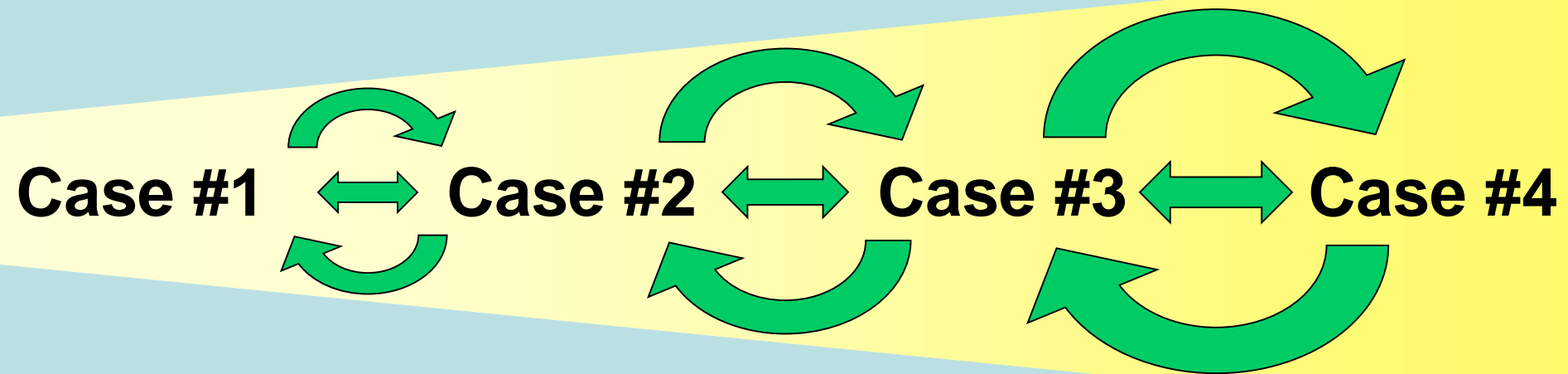
- **Close working relationship between Minnesota Department of Health (MDH) and Minnesota Department of Agriculture (MDA)**
  - **Tracebacks inform the investigation**
  - **Willing to trace back foods that are not yet implicated**
  - **Willing to test suspect foods**

## **July 10, 2014**

- **Cluster of 10 *E. coli* O111 infections with indistinguishable PFGE subtype identified**
- **Median age: 26 years**
- **80% female**
- **Residents of multiple Minnesota counties**
- **First 4 case interviews:**
  - **2 ate at the same LeeAnn Chin**
  - **1 ate at Benihana**
  - **1 ate at Applebee's**

# Minnesota Approach to Investigation of PFGE Clusters: Iterative Cluster Investigation Model

Include restaurants named by previous cases on initial interviews



Ask about restaurants named by subsequent cases

# July 12, 2014

- **Case count: 13**
  - 9 interviewed
    - 5 of 9 ate at Applebee's (three at a single location)
      - 4 of 5 ate Oriental Chicken Salad
- **Environmental Health staff visits restaurant locations**
- **Applebee's removed Oriental Chicken Salad from the menu**



# July 15, 2014

- 10 cases interviewed
  - 7 of 10 ate at Applebee's (5 locations)
    - 5 of 7 ate Oriental Chicken Salad
    - 1 of 7 ate ribs, cole slaw, and French fries
    - 1 of 7 ate Chicken Wonton Tacos



# Commonalities Among Foods Consumed by Cases

~~Oriental~~  
~~Cantonese~~  
Salad

~~Rolls~~  
Cole Slaw

~~Cantonese~~  
Wonton  
Tacos

~~Fren~~  
~~Fries~~



# Applebee's: Oriental Salad mix chain.

**Green Cabbage:** Oriental salads, Cole Slaw, Chicken wontons, Thai Salads, Oriental rollups

**Red Cabbage:** Oriental mix, Thai salad, Oriental rollup sandwich

**Romaine lettuce:** Oriental salads, House salads, Caesar salads, Strawberry avocado salad, Fiesta salad, Classic turkey breast sandwich, Thai salad, Oriental rollup sandwich

**Shredded Carrots:** Oriental salad mix, Chicken Wontons, Cole Slaw, Oriental rollup sandwich

**Chicken Fingers:** All chicken baskets/platters, Oriental rollup sandwich, 4 cheese chicken penne pasta, all fried chicken salad plates

**Chicken Breasts** All grilled chicken items in the store.

**Rice Noodles:** Oriental salads, Oriental rollup sandwich

**Almonds:** Oriental Salads, Thai Shrimp Salad, Grilled shrimp and spinach salad, Signature sirloin with shrimp

**Stir Fry:** Grilled oriental salad, Oriental rollup sandwich

**Oriental dressing:** Oriental salads and Oriental Rollup Sandwiches

**Cole slaw** is used on: Baby Back Ribs, Chicken Wontons, Riblet and Chicken platters, Double Crunch Shrimp, Fried Walleye Platter

**Iceberg Lettuce** : Green Goddess Wedge salad, House Salad, Fiesta salad, Club House Grille, American BLT, Chicken Fajitas Rollup, Fajitas, Nachos, Quesadillas. All burgers EXCEPT Black and Bleu, Philly and sliders.

# Ingredient-Specific Case-Control Study: One Applebee's Location

Food Item	Cases	Controls	p-value
Oriental Chicken Salad	3/3	3/13	0.04
Green cabbage	3/3	3/13	0.04
Red cabbage	3/3	3/13	0.04
Carrots	3/3	3/13	0.04
Rice noodles	3/3	3/13	0.04
Almonds	3/3	3/13	0.04

# Consumption Frequency of Oriental Salad Ingredients Among Applebee's Cases (n=13)

<b>Green cabbage</b>	<b>13/13</b>
<b>Shredded carrots</b>	<b>13/13</b>
<b>Red cabbage</b>	<b>9/13</b>
<b>Rice Noodles</b>	<b>9/13</b>
<b>Almonds</b>	<b>9/13</b>
<b>Romaine lettuce</b>	<b>9/13</b>
<b>Oriental dressing</b>	<b>9/13</b>
<b>Chicken fingers/chicken breasts</b>	<b>12/13</b>
<b>Stir fry sauce</b>	<b>2/4</b>

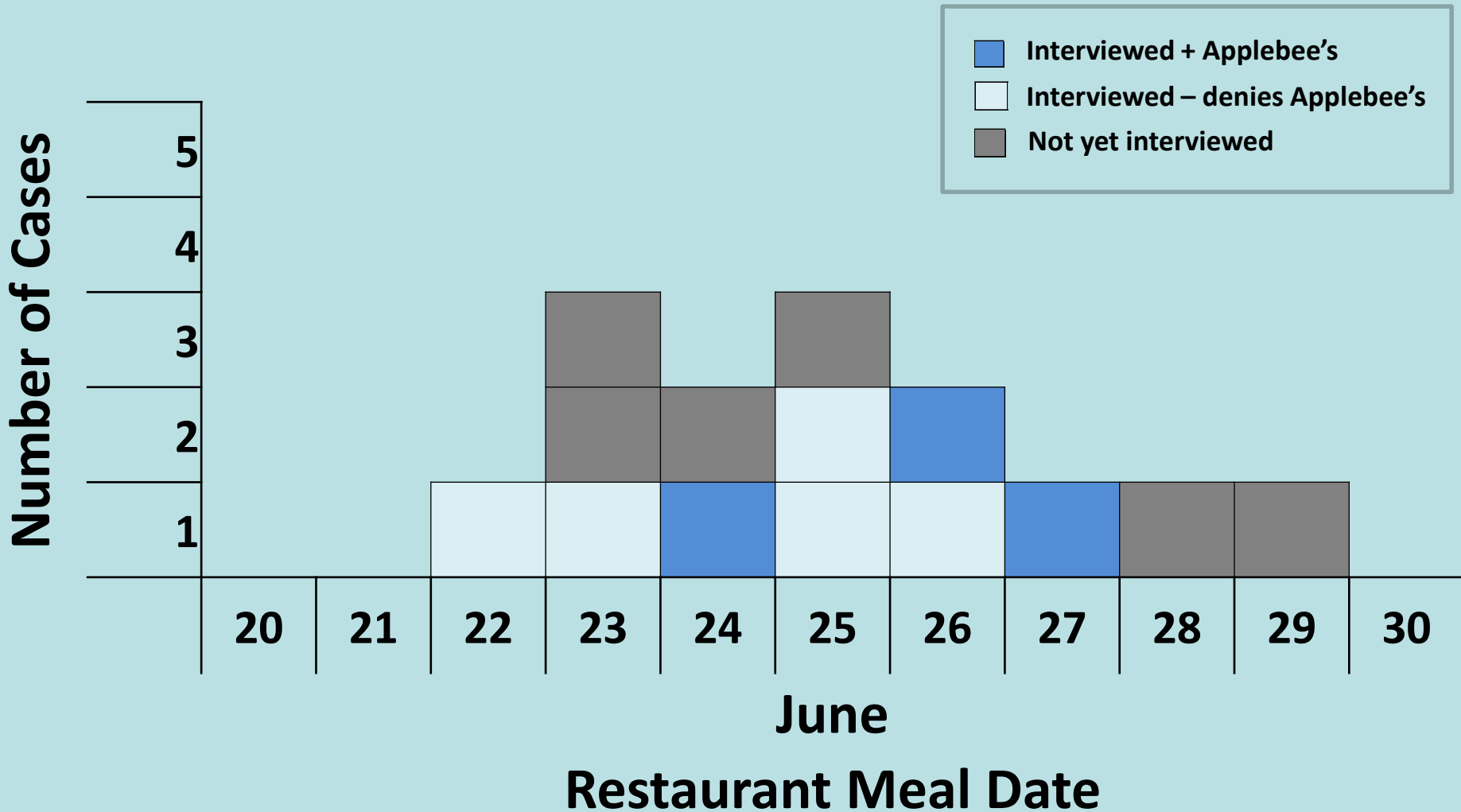
# STEC 0111 Case Data

- 14 complete interviews
  - 13 ate at one of 9 Applebee's restaurants
    - Meal dates, 6/23 to 6/29
  - 1 ate at Yard House
    - Meal date 6/22, onset date 6/25
    - Ate fish tacos

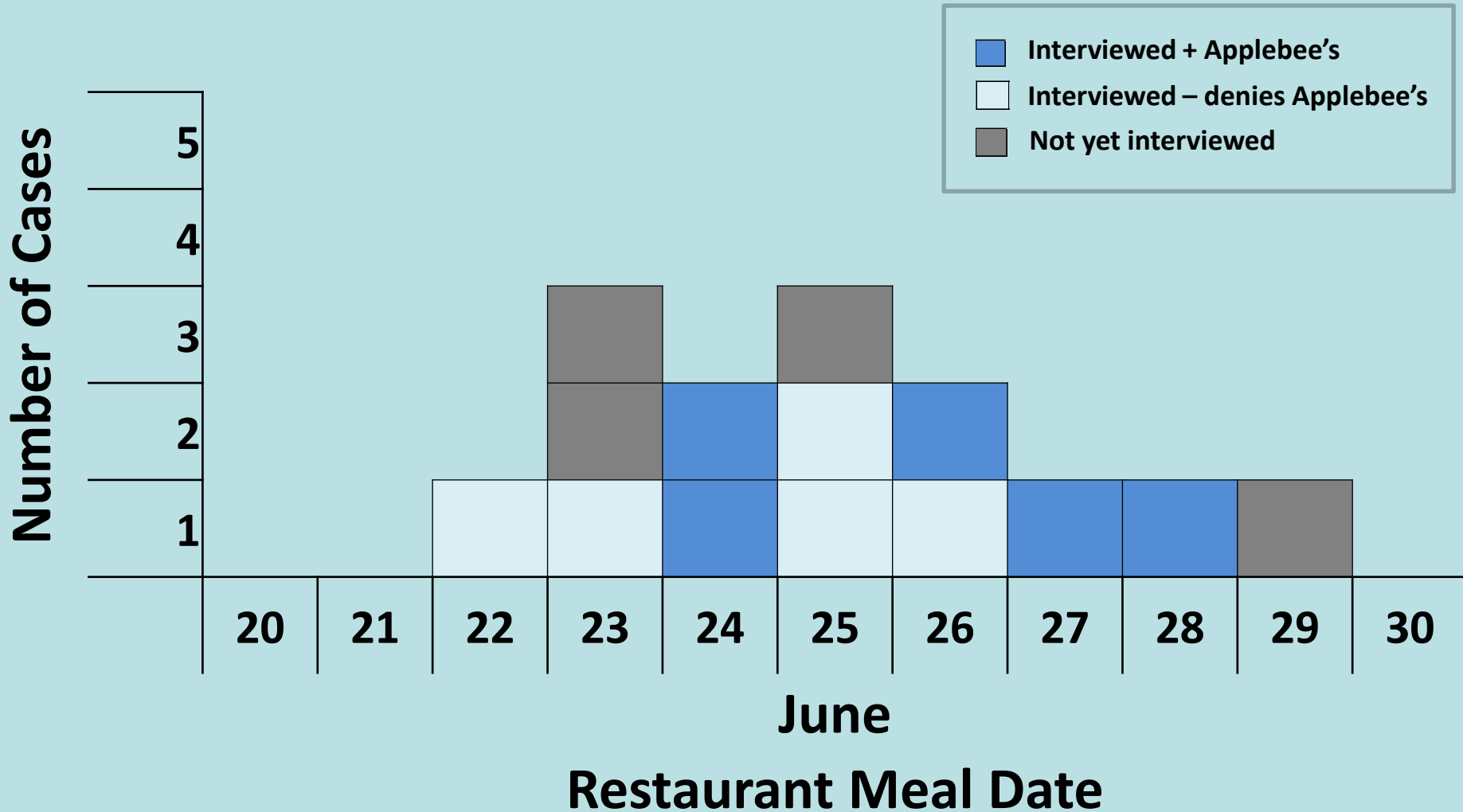


**One case in Wisconsin ate the Oriental Chicken Salad at an Applebee's location in Wisconsin**

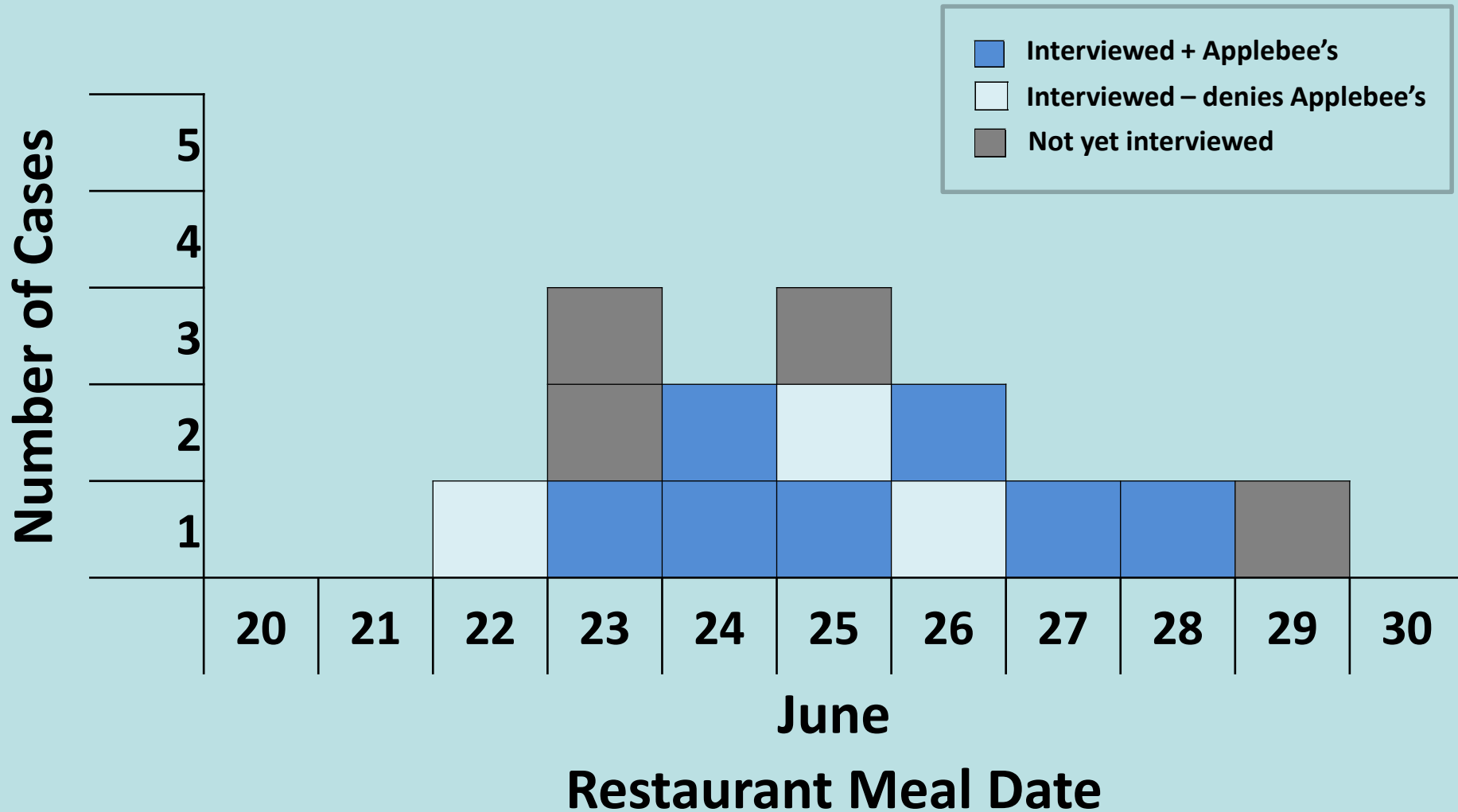
# As of July 10: Minnesota *E. coli* O111 Outbreak Cases by Meal Date (n=15)



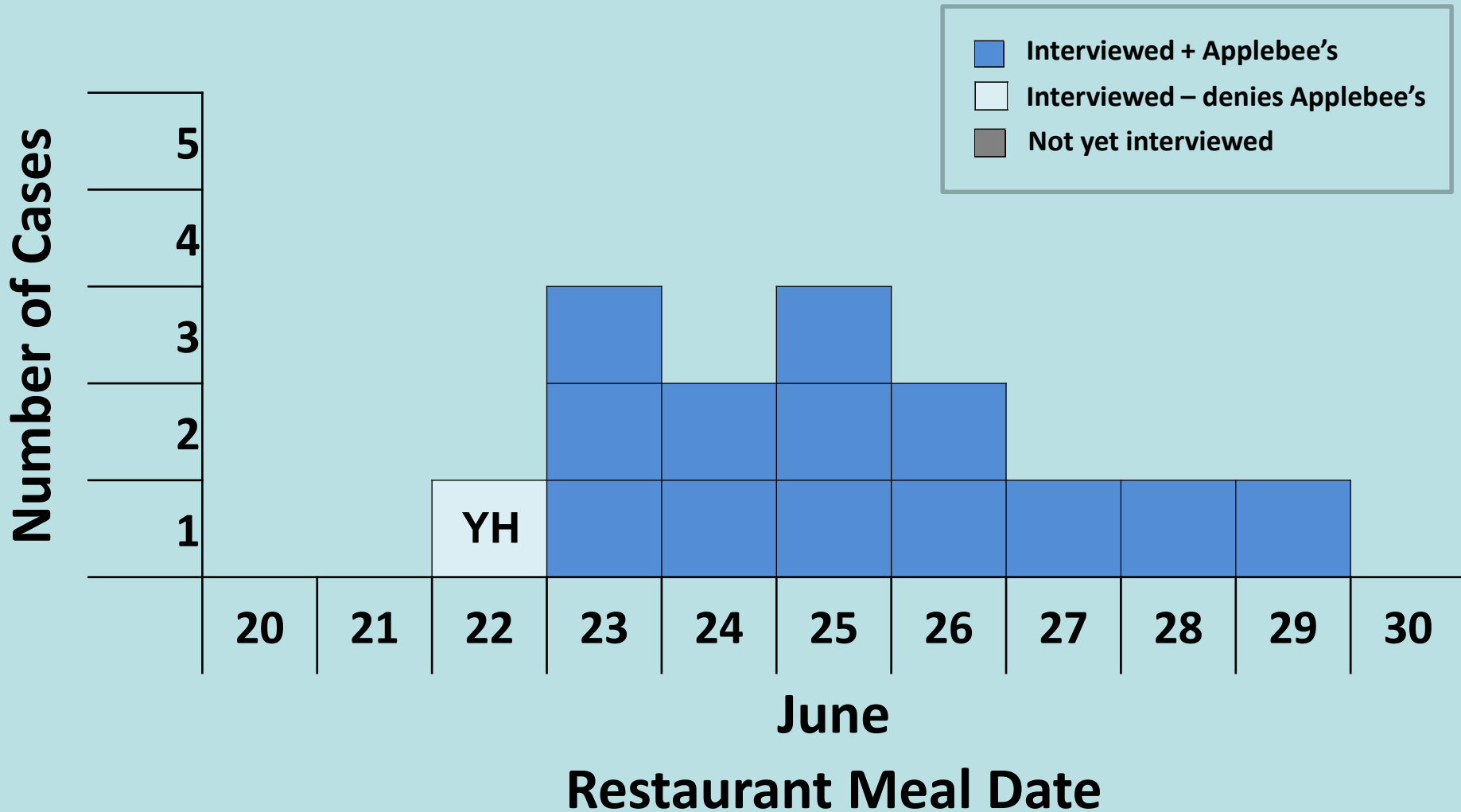
# As of July 12: Minnesota *E. coli* O111 Outbreak Cases by Meal Date (n=15)



# As of July 15: Minnesota *E. coli* O111 Outbreak Cases by Meal Date (n=15)



# As of July 18: Minnesota *E. coli* O111 Outbreak Cases by Meal Date (n=15)

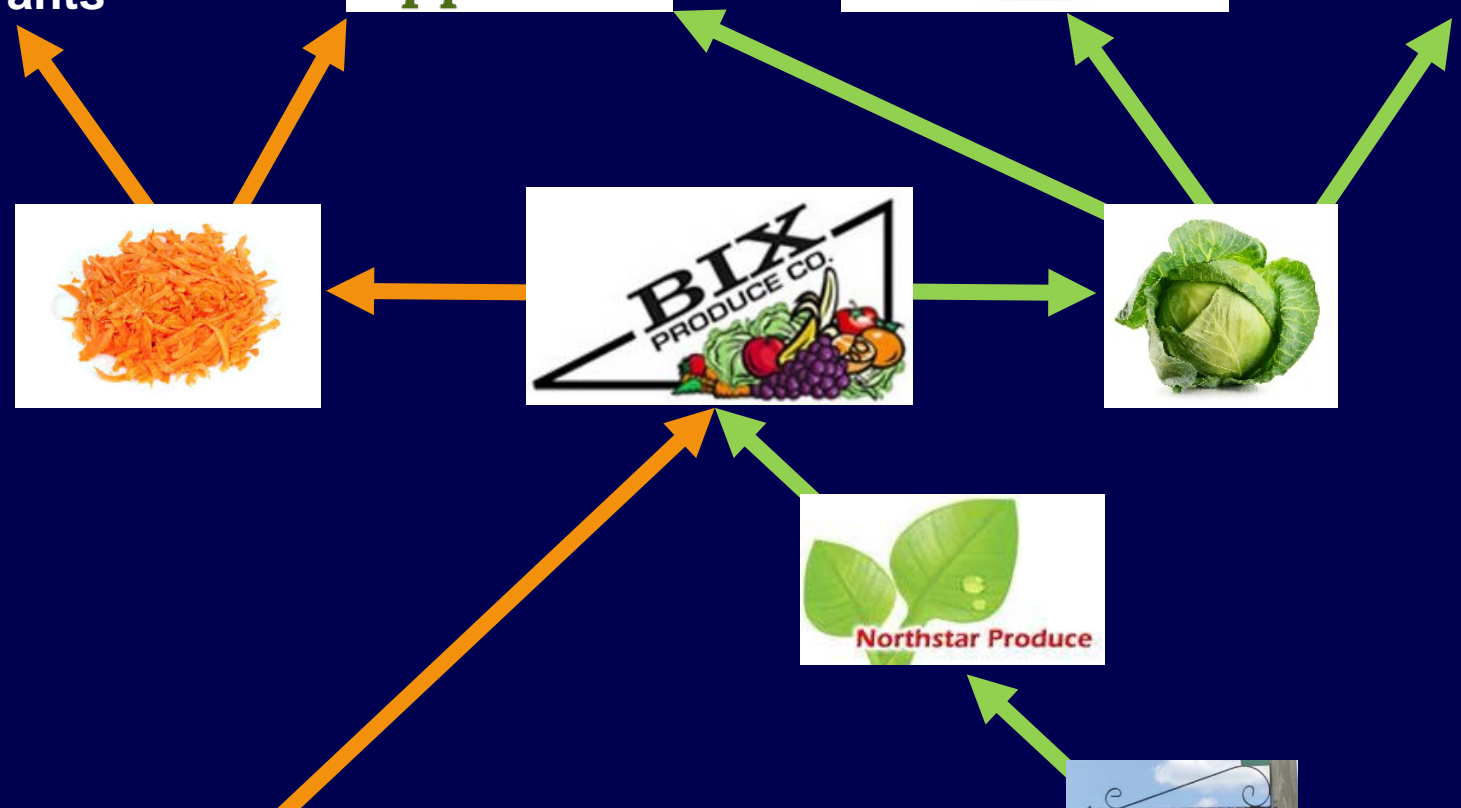




Numerous other  
restaurants



Other  
restaurants



Days Prior to Meal Date Shipper/Packer Received at Restaurant

Restaurant	0	1	2	3	4	5	6	7	8	9	10	11	12
Applebee's Woodbury - Case 1 Meal Date - 6/24		Jack's #26436 1 cs			Jack's #26436 1 cs				Burch #26347 1 cs			Burch #26347 1 cs	
Applebee's Woodbury - Case 2 Meal Date - 6/24		Jack's #26436 1 cs			Jack's #26436 1 cs				Burch #26347 1 cs			Burch #26347 1 cs	
Applebee's Woodbury - Case 3 Meal Date - 6/26				Jack's #26436 1 cs			Jack's #26436 1 cs				Burch #26347 1 cs		
Applebee's Monticello - Case 4 Meal Date - 6/25			Costa #38594 1 cs						Burch #26347 1 cs				
Applebee's Roseville - Case 5 Meal Date - 6/26			Costa #38594 1 cs				Jack's #26434 1 cs		JRB #26406 1 cs				
Applebee's Blaine (Northtown) - Case 6 Meal Date - 6/27	Jack's #26489 1 cs				Costa #38594 1 cs			Jack's #26436 1 cs					
Applebee's Blaine (Northtown) - Case 13 Meal Date - 6/23	Costa #38594 1 cs			Jack's #26436 1 cs				JRB #26372 1 cs			Borzynski's #26369 1 cs		
Applebee's Duluth - Case 7 Meal Date - 6/28		Jack's #26489 1 cs		Costa #38594 1 cs					Jack's #26436 1 cs				
Applebee's Duluth - Case 14 Meal Date - 6/25	Costa #38594 1 cs					Jack's #26436 1 cs						Burch #26347 1 cs	
Applebee's Blaine (Peasant Ridge) - Case 8 Meal Date - 6/21					Jack's #26436 2 cs				JRB #unk 2 cs				
Applebee's Willmar - Case 9 Meal Date - 6/23				Jack's #26434 1 cs			JRB #26406 1 cs						
Yard House St. Louis Park - Case 10 Meal Date - 6/22				Jack's #26434 1 cs									
Applebee's New Hope - Case 12 Meal Date - 6/29			Jack's #26489 1 cs							Jack's #26436 1 cs			
Applebee's Rice Lake - WI Case 1 Meal Date - 6/25		Costa #38594 1 cs			Jack's #26436 2 cs							Burch #26347 1 cs	

\*\*Note - Case 11 (Applebee's Bemidji) was left out as meal date is unknown

# Conclusions

- **Real-time subtyping**
- **Real-time interviewing (and re-interviewing!)**
- **Ingredient-specific analyses**
- **Informational tracebacks**
  - **MDA Rapid Response Team**

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