

Outbreak Dissection: Hepatitis A Virus Infections Associated with a Frozen Berry Blend

- **Meg Adams-Cameron, MPH**
 - Foodborne Epidemiologist, NMDH
 - Initial identification of the outbreak
- **Melissa Collier, MD, MPH**
 - Medical Epidemiologist, Division of Viral Hepatitis, CDC
 - Overview of multistate investigation
- **Alicia Cronquist, RN, MPH**
 - Foodborne and Enteric Disease Epidemiologist, CDPHE
 - Local considerations for post-exposure prophylaxis
- **Jennifer Beal, MPH**
 - Epidemiologist, FDA CORE Signals and Surveillance Team
 - Traceback, traceforward, and regulatory actions

New Mexico Experience

Remembrance of Things Past:

Tools for Food Consumption Recall

Hepatitis A and Frozen Berries, New Mexico's Experience



Meg Adams-Cameron, MPH
Foodborne Epidemiologist
New Mexico Department of
Health

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Hepatitis A: New Mexico's Experience

- Initial problem identification
 - Number of cases
 - Demographics
 - Usual explanations
- Initial data collection
 - Shotgun questionnaire
 - Lifestyle similarities
 - Common exposures

Old Tools, New Uses

- Credit and debit card statements
- Membership shopper card records
- Product package labels



Old Tools, New Uses

- Credit and debit card statements
 - complete lists
 - accurate record

Old Tools, New Uses cont.

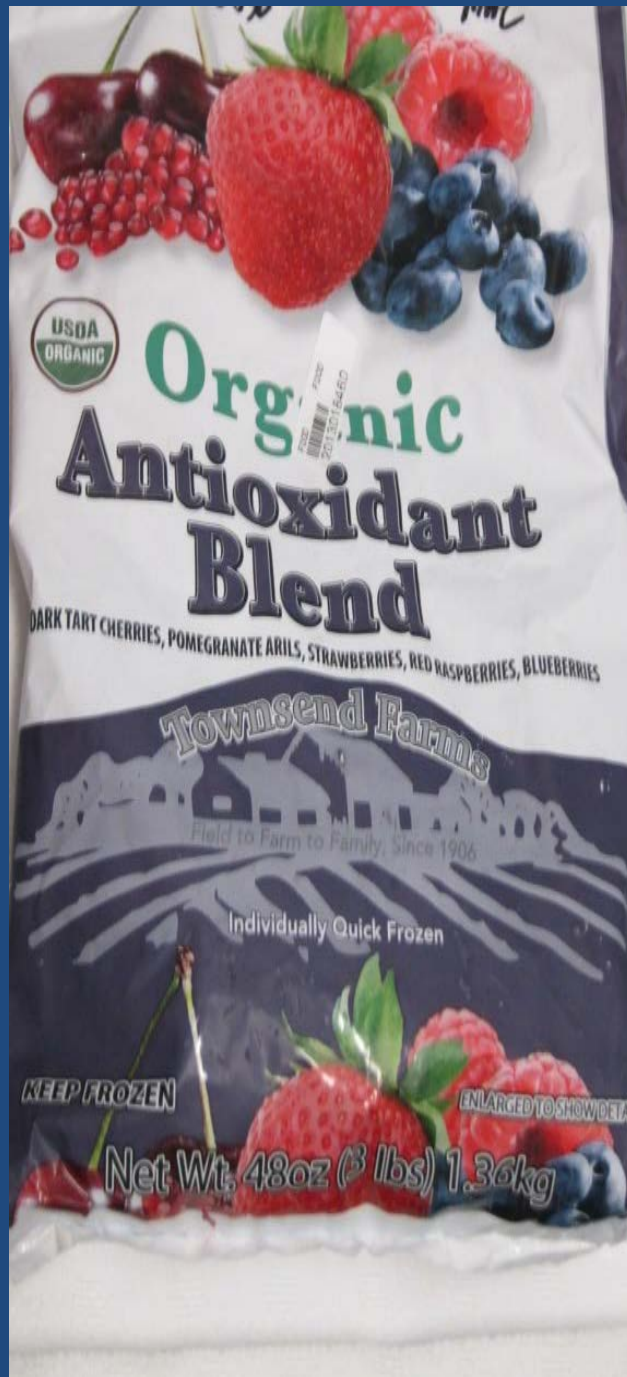
Product package labels



Old Tools, New Uses cont.

- Membership shopper card records
 - distribution pattern
 - brand names





Please hold questions until end of
entire session

Many Thanks to Colleagues:

New Mexico Department of Health

David Selvage, Paul Ettestad, Julianna Ferreira, Catherine
Moonan

Colorado Department of Public Health and Environment

Alicia Cronquist, Shaun Cosgrove, Nicole Comstock, Erin Epton



Overview of Multistate Investigation

Outbreak Timeline

- **May 22 – First conference call hosted by Colorado**
- **Possible cluster of hepatitis A illnesses among Costco shoppers**
- **New Mexico specimens being genetically sequenced**

Outbreak Timeline

- **May 23 and 24 — First multistate calls**
 - New Mexico, Colorado, Nevada, Texas, Arizona, California, CDC, and FDA
- **Proposed case definition: ‘acute hepatitis A with symptom onset in May, 2013 with no international travel or other clear source of infection’**
- **Preliminary information from questionnaires and Costco shopper card information**
 - Smoothies, fresh spinach, fresh berries, and frozen berries

Outbreak Timeline

- **May 27 – first hepatitis A virus (HAV) testing results available**
 - Sequencing of the 315 base pair VP1-P2B of the HAV genome
 - Both New Mexico specimens had identical and unique VP1-P2B sequences
 - HAV genotype IB, uncommon in the United States

Outbreak Timeline

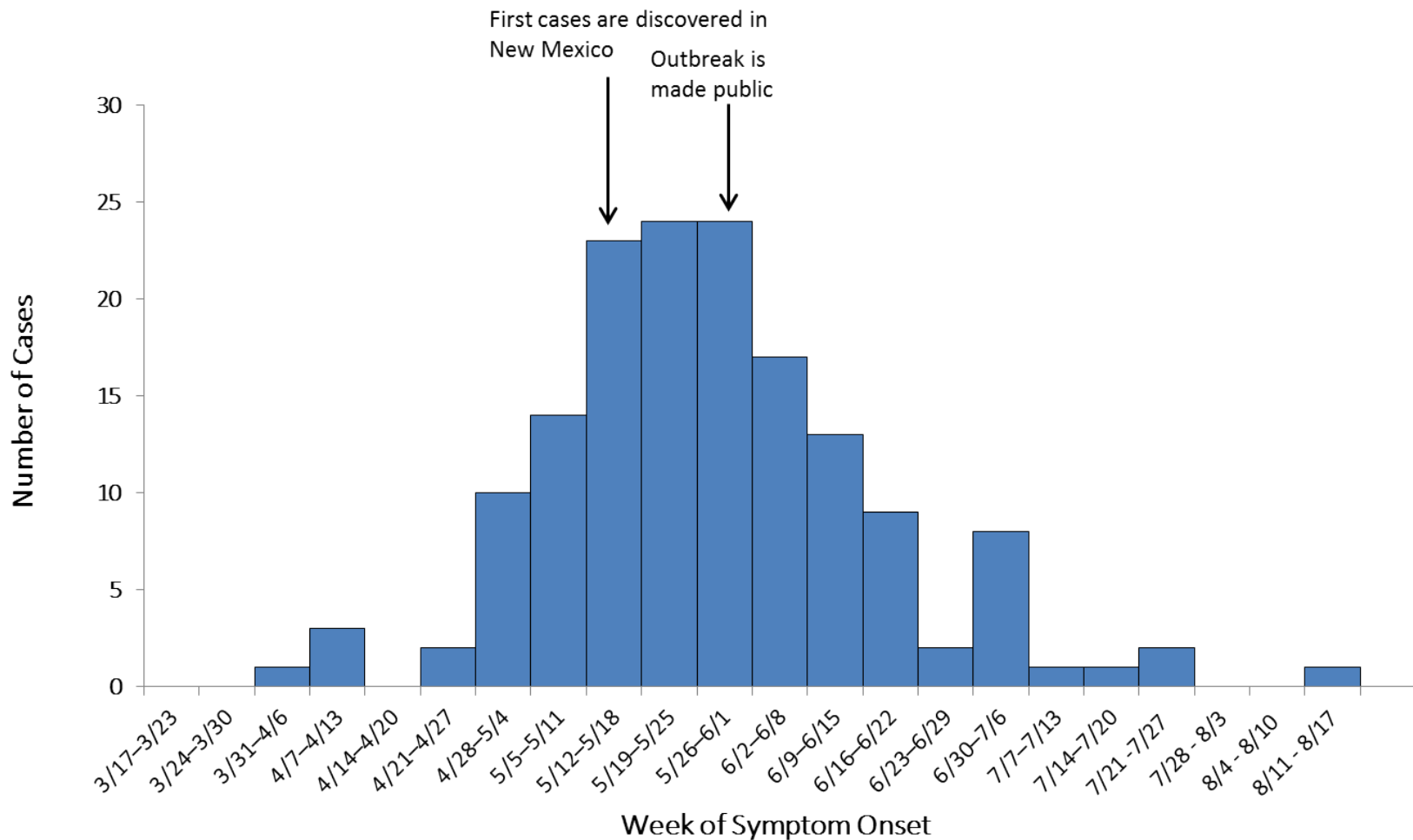
- **May 29 – Photos of product recovered from two HAV infected persons from New Mexico and one from Nevada**
 - One common product: ‘Townsend Farms Organic Antioxidant Blend’
 - Eleven of 17 total suspected case-patients recalled consuming ‘Townsend Farms Organic Antioxidant Blend’
 - Binomial probability equation – population prevalence of exposure to ‘Townsend Farms Organic Antioxidant Blend’ would have to be $>75\%$ for the association to not be statistically significant

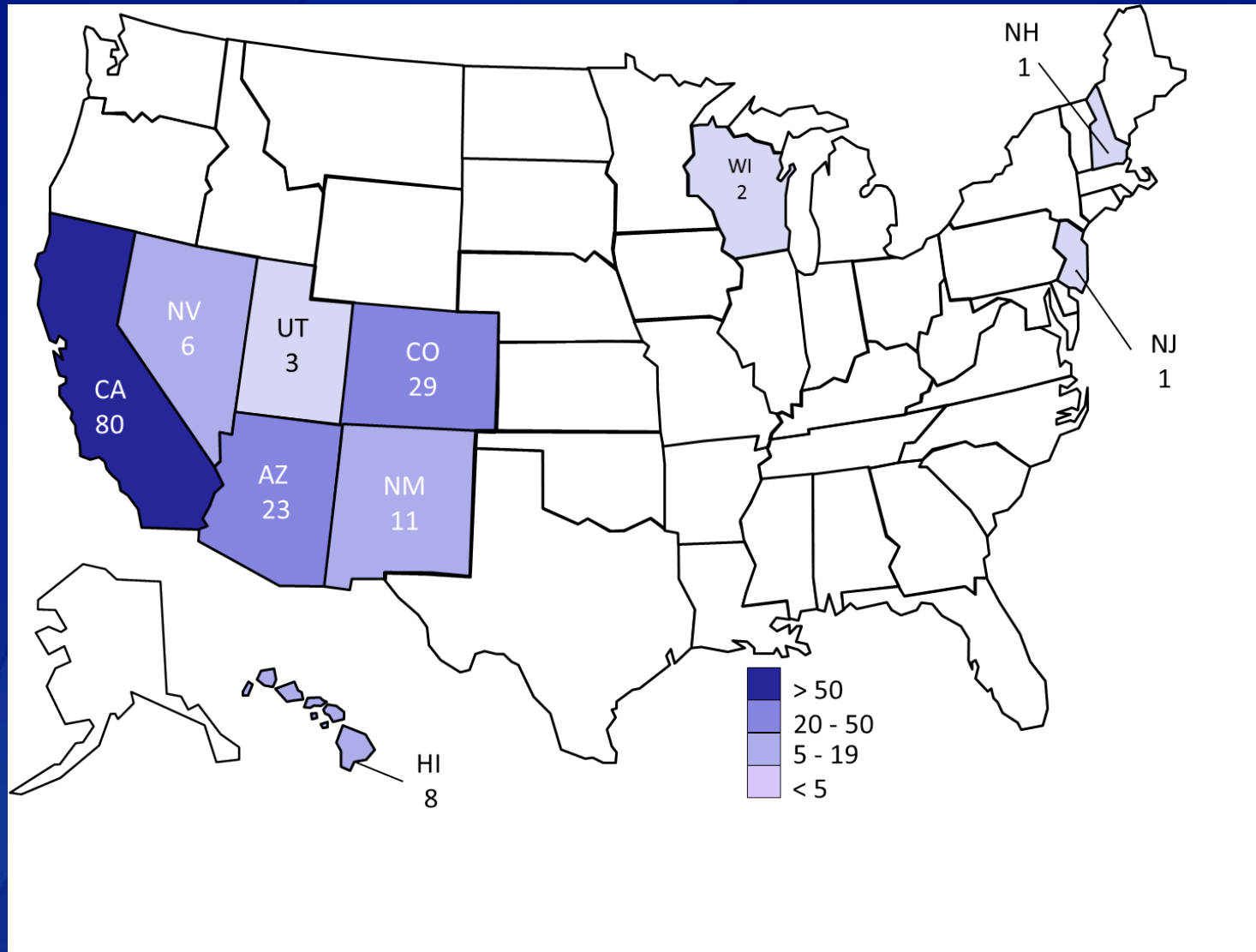
Outbreak Timeline

- **Costco notified of the suspected link**
 - Product distribution information obtained
 - States in which product was sold notified
- **May 31 – Outbreak is made public**
- **June 3, 2013 – updated Epi-X posting**

Confirmed case definition

- Acute HAV infection
- Persons reporting 'Townsend Farms Organic Antioxidant Blend' consumption during the illness incubation period
- Infection with genotype IB HAV





Demographic and clinical information

- Female 55%
- White, non-Hispanic race 58%
- Aged 40 – 64 years 58%
- Hospitalization required for 44%
 - Three cases of fulminant hepatitis
 - One person required a liver transplant
- ‘Townsend Farms Organic Antioxidant Blend’ – 153

Laboratory information

- **Total 119 specimens collected from 164 confirmed case-patients**
- **Genotype IB – 117 total**
 - One major cluster – 99 identical specimens
 - Three minor clusters – 13 specimens
 - Five individually unique specimens
- **Genotype IA – 2 total**

Purchase information

- **‘Townsend Farms Organic Antioxidant Blend’ was purchased 283 times by 110 case-patients**
- **Most (77%) of these purchase dates were between February 17 and May 12, 2013**
- **Forty case-patients still had the product in their possession when interviewed**
 - Of these, 3 did NOT purchase the product

Public Health Actions

- **Notifying the public**
- **Recommending against consumption of ‘Townsend Farms Organic Antioxidant Blend’**
- **Evaluation for post-exposure prophylaxis**
 - Vaccine and immunoglobulin administered at state and local health departments
 - Vaccine administered to Costco customer through Costco pharmacies
- **Regulatory response**

Challenges

- **Very long incubation period – 15–50 days, average onset 28 days after exposure**
- **Contaminated product was frozen, with a long shelf life**
- **Large number of post exposure prophylaxis provided**
 - Strain on already overwhelmed health departments
- **Complete surveillance data from states was unavailable in real time**
- **Required three different CDC centers to pull off the public health investigation and response**

Successes

- The contaminated food item was quickly identified and removed from shelves
- Timely notification of approximately 250,000 people who bought 'Townsend Farms Organic Antioxidant Blend' through automated phone calls by Costco
- Post exposure prophylaxis through local and state health departments
- Post exposure vaccination of >10,000 Costco shoppers through Costco pharmacies

Future improvements

- **Better coordination between different CDC entities**
 - Division of Viral Hepatitis
 - Division of Food borne, Water borne, and Environmental Diseases
 - Immunization Services Division
- **Creation of a specific HAV hypothesis generating food exposure questionnaire**
- **Quicker guidance for states on how to prioritize post exposure prophylaxis**

Acknowledgements

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 - John Ward, Jeff Efirid Scott Holmberg, Fujie Xu, Jan Drobeniuc, Yury Khudyakov, Anil Suryaprasad, Noele Nelson, Gemechu Gerbi, Ben Kupronis, Cynthia Jorgensen, and Daulati Thakare
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 - Ian Williams, Matt Wise
- **Immunization Services Division**
 - Jeanne Santoli
- **FDA CORE Response 1 Team**
- **State colleagues**

Colorado Perspective: Post-Exposure Prophylaxis

Considerations About Post-Exposure Prophylaxis During an Active Outbreak Investigation

Alicia Cronquist

Colorado Department of Public Health and
Environment

Hepatitis A Post-Exposure Prophylaxis (PEP) Primer

- Administer within 14 days of exposure
- Advisory Committee on Immunization Practices (ACIP) guidance
 - Immune globulin (IG) for persons < 1 year
 - Hepatitis A vaccine for persons 1-40 years
 - IG for persons > 40 years
 - IG for others who can't receive vaccine (immunocompromised, chronic liver disease, other contraindications)

Who was 'exposed'?

- Clarifying scope of exposure was not easy
- Cases in western states only, so offer PEP:
 - Only in states with known cases?
 - Based on supply distribution?
 - Nationwide?
- Which products?
 - Implicated berry mix with pomegranate arils
 - Other products made from same originating lot?

Which form of PEP?

- Pediatric hepatitis A vaccine
 - MD offices and health departments usually have it in ready supply (VFC program)
- Adult hepatitis A vaccine
 - Less available in MD offices and in public health departments
- Immune globulin
 - Historically there has been a shortage
 - Rarely available from MD offices or hospitals
 - Limited public health resources to purchase it
 - Difficult to distribute/administer around state

What did states do?

- Most states with cases and in western distribution region offered PEP to anyone who consumed the product within 14 days
 - included a second product discovered to have originated from same lot of arils
- Many modified PEP recommendations to limit amount of IG that would be offered

Suggestions for the future

- Studies to assess effectiveness of vaccine compared with IG for PEP
- Involve the CDC vaccine folks immediately for any hepatitis A outbreak
- Consider modifying rules for information sharing between FDA and CDC/states when there is a public health intervention (e.g. PEP) that will occur based on the (incomplete) data

FDA Perspective



Traceback/Traceforward and Regulatory Actions Hepatitis A Outbreak Associated with Frozen Berry Blend INFORM 2013 Conference

Jennifer Beal, Signals and Surveillance Team

Coordinated Outbreak Response and Evaluation (CORE) Network

US Food and Drug Administration

Traceback Overview

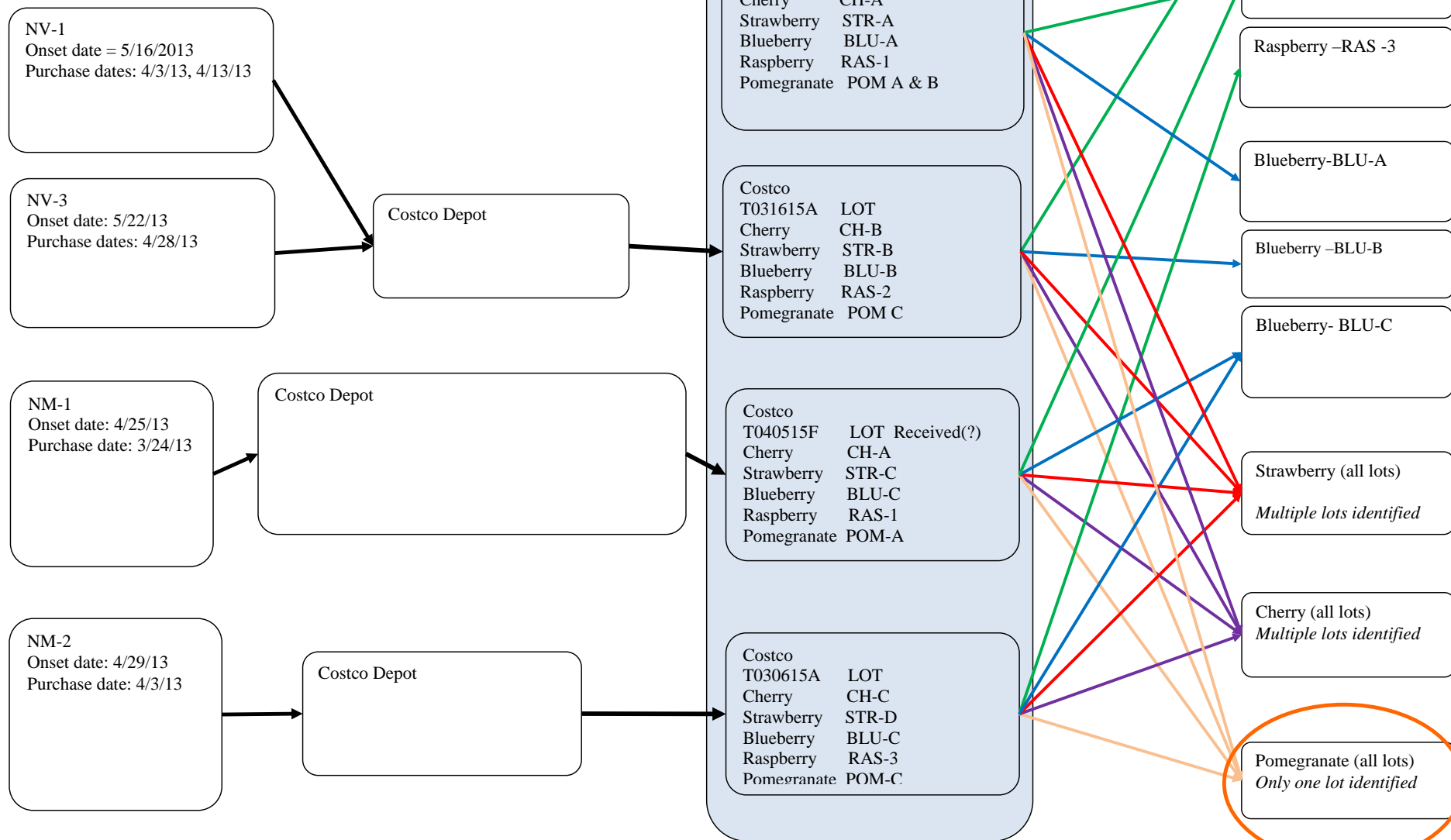
- Purpose: Determine origination of contamination
- Traceback activities (through-out supply chain):
 - ★ **Inspection:** Evaluation of ingredient usage and handling, collection of records
 - ★ **Record Review:** meticulous evaluation of invoices, purchase orders, and production records
- Actions to protect public health are dependent upon identifying the source of the contamination

Traceback: The Details

- FDA selected four confirmed clinical cases for traceback based on:
 - ★ Case-patient's food history indicating exposure to the suspect product
 - ★ Shopper card information
 - ★ Laboratory confirmation of Hepatitis A/1B genotype outbreak strain
- Beginning with points of service and specific lots of Townsend Farms antioxidant berry blend product for each identified case, worked backwards to identify common lots of each ingredients used in TF product
- Particular challenge of TF product: multiple ingredients

Hepatitis A/Organic Frozen Berry and Pomegranate Seeds

DRAFT TRACEBACK INVESTIGATION FLOW DIAGRAM



Traceback: Outcome

- Townsend Farm had single suppliers for three ingredients (cherries, strawberries and pomegranate seeds)
- Only pomegranate seeds could be narrowed down to a single lot for all four traceback legs
 - ★ Why shopper card information/food history is so important for TB
- Country of Origin for imported pomegranate seeds was Turkey
 - ★ Supported earlier hypothesis of contamination origins based on global 1B genotype prevalence

Traceback: Outcome (continued)

- Recalls: Townsend Farms recalled Townsend Farms Organic Antioxidant Blend and Harris Teeter Organic Antioxidant Berry Blend
- Import Actions: Göknur added to Import Alerts 99-35 and Import Alert 99-23
- Foreign Inspection: Planned for September 2013 at Göknur; canceled until further notice due to US Department of State travel recommendations based on security concerns

What Comes Next? Traceforward

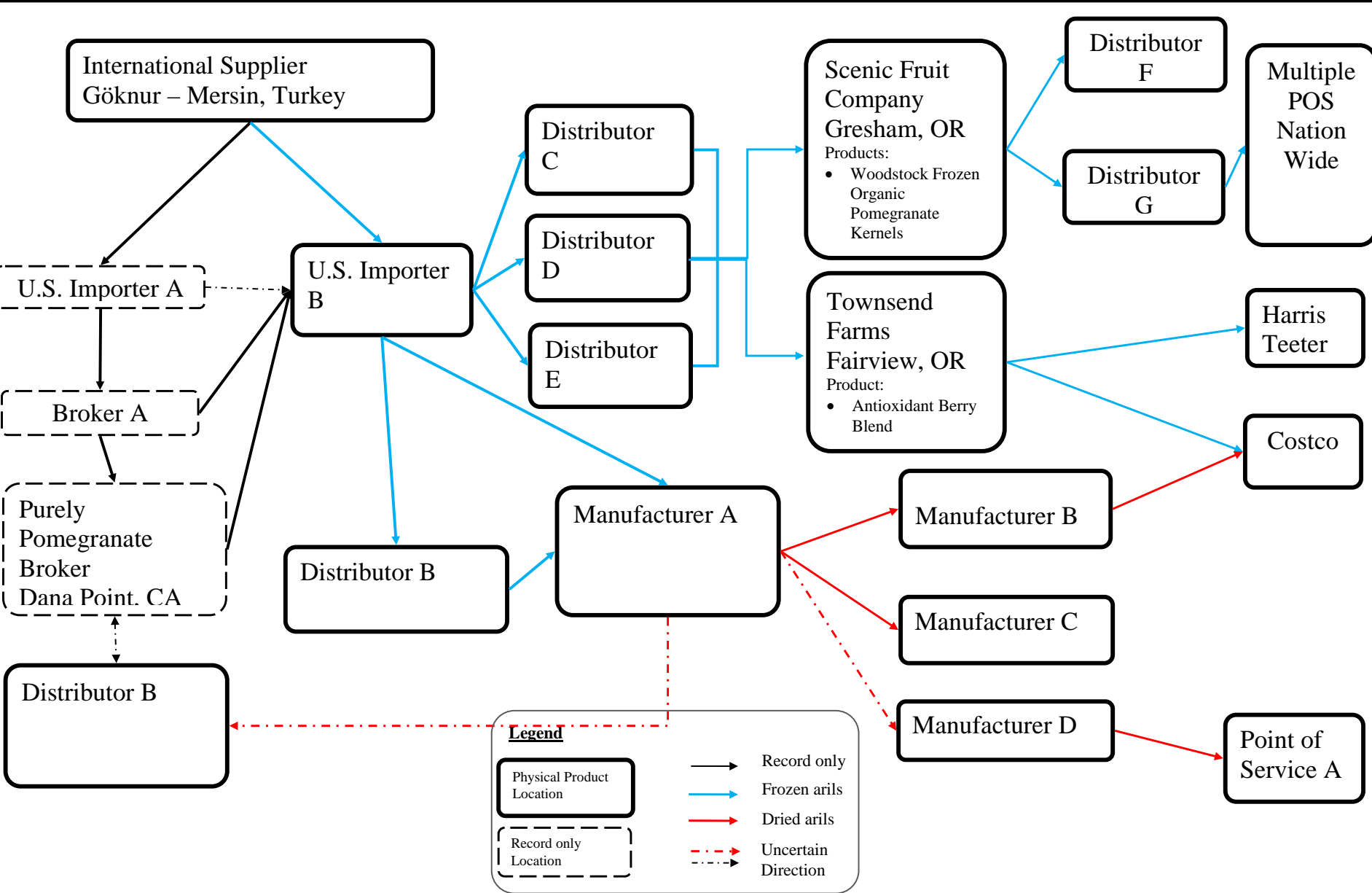
- Purpose: identify all recipients of a contaminated ingredient and evaluate whether additional products need to be recalled
- Traceforward Activities (throughout supply chain)
 - ★ Inspection: Evaluation of ingredient usage and handling, collection of records
 - ★ Record Review: meticulous evaluation of invoices, purchase orders, and production records
- Additional recalls are dependent on identifying where else the ingredient was distributed AND how it was used there

Traceforward: The Details

- Starting with the implicated lot of pomegranates from Göknur, through traceforward FDA identified every firm that received the contaminated lot and evaluated what they did with it
 - ★ If contaminated lot received a kill step, no recall was required
- Traceforward resulted in the following recalls:
 - ★ Townsend Farm mixed berry and pomegranate product marketed by Harris Teeter
 - ★ Scenic Fruit Company recalled frozen pomegranate kernels

Hepatitis A/Organic Frozen Berry and Pomegranate Seeds

DRAFT TRACEFORWARD INVESTIGATION FLOW DIAGRAM



Communication Challenges with Traceback/Traceforward: It's a Balancing Act

- **Protecting the public health while also protecting confidential commercial information (which FDA is required by law to do)**
 - ★ Unique nature of Hepatitis A infection and post-exposure prophylaxis added urgency to this situation
 - ★ Utilization of 20.91 agreement to satisfy both needs
- **Rapidly but also accurately identifying origination of contamination**
- **Rapidly but also accurately identifying everywhere else contaminated ingredient was distributed, and whether additional products posed a risk**

Acknowledgements

- **CDC (Division of Viral Hepatitis, Division of Foodborne, Waterborne, and Environmental Diseases)**
- **States and local authorities within (CA, CO, FL, HI, MD, NV, NH, NY, OR, UT, VA, WA, WV)**
- **FDA (ORA district offices [ATL, BLT, DAL, DEN, DET, FLA, KAN, LOS, NWJ, NYK, PHI, SAN, SEA], ORA HQ, CFSAN, OCC, OC, OCM, CORE)**

Discussion/Questions