GOOD FOOD GONE BAD...
... and other legal items.

Dana Fejes, MPH
Epidemiologist
Montana DPHHS
(406)444-3049
dfejes@mt.gov
Overview

Administrative Rules

Reporting

Control measures: Incorporation of Reference Food handler exclusion rules

Advances in Outbreak Investigations

PFGE & WGS

Examples of Montana outbreaks
Who can report?

37.114.201 REPORTERS

• any person,

• who knows or has reason to believe that a case exists of a reportable disease or condition defined in ARM 37.114.203

• must immediately report to the local health officer
How to investigate a case?

37.114.314 INVESTIGATION OF A CASE
the local health officer must:
(a) verify the diagnosis;
(b) make an epidemiologic investigation;
(c) take appropriate steps, to prevent or control the transmission of disease; and
(d) notify contacts to prevent contracting the disease.
FOOD ESTABLISHMENTS
(5) Specific communicable disease control measures, outlined in the Food Code, should be followed unless more stringent rules are provided in ARM 37.114.501.

Special situations

37.114.301


• (4) Persons attending or residing in congregate settings may be subject to additional restrictions and exclusions to prevent further transmission as determined by the local health authority.
CHILD CARE
Children must be
- without fever of 101°F or greater for 24 hours
- without vomiting and diarrhea for 24 hours
Specific exclusion for some bacterial infection (e.g. pinkeye), chickenpox and jaundice
No exclusion for a discharge from the nose which is not accompanied by a fever.
Special exclusions for:
- Shigella or Salmonella → 2 negative stools
- Hepatitis A virus → one week after onset of illness or jaundice, or IG administered
Special exclusions for STEC & Typhoid Fever

37.114.526 ESCHERICHIA COLI ENTERITIS (SHIGA-TOXIN PRODUCING)

A child attending day care or child care as defined in ARM 37.95.102 must be excluded from such care until diarrhea resolves and two stool cultures collected at least 24 hours apart, obtained at least 48 hours after antimicrobial therapy has been discontinued, are negative.

37.114.590 TYPHOID FEVER

A child attending child care in facilities defined in ARM 37.95.102 must be excluded from such care until diarrhea resolves and three stool cultures collected at least 24-hours apart, obtained at least 48 hours after antimicrobial therapy has been discontinued, are negative.
Outbreak Reporting Requirements

37.114.203 REPORTABLE DISEASES AND CONDITIONS

(2) Also reportable is an outbreak of any communicable disease listed in the "Control of Communicable Diseases Manual, an Official Report of the American Public Health Association" (20th edition, 2015) in an institutional or congregate setting and any unusual incident of unexplained illness or death in a human or animal with potential human health implications.

37.114.101 DEFINITIONS

"Outbreak" means an incidence of a disease or infection significantly exceeding the incidence normally observed in a population of people over a period of time specific to the disease or infection in question.
Advances in Outbreak Investigations
The Difference between PFGE & WGS

Chapter 4

The Rabbit Sends in a Little Bill

It was the White Rabbit, trotting slowly back again, and looking anxiously about as it went, as if it had lost something; and she heard it muttering to itself ‘The Duchess! The Duchess! Oh my dear paws! Oh my fur and whiskers! She’ll get me executed, as sure as ferrets are ferrets! Where CAN I have dropped them, I wonder?’ Alice guessed in a moment that it was looking for the fan and the pair of white kid gloves, and she very good-naturally began hunting about for them, but they were nowhere to be seen—everything seemed to have changed since her swim in the pool, and the great hall, with the glass table and the little door, had vanished completely.

Very soon the Rabbit noticed Alice, as she went hunting about, and called out to her in an angry tone, ‘Why, Mary Ann, what ARE you doing out here? Run home this moment, and fetch me a pair of gloves and a fan! Quick, now!’ And Alice was so much frightened that she ran off at once in the direction it pointed to, without trying to explain the mistake it had made.

‘He took me for his housemaid,’ she said to herself as she ran. ‘How surprised he’ll be when he finds out who I am! But I’d better take him his fan and gloves—that is, if I can find them.’ As she said this, she came upon a neat little house, on the door of which was a bright brass plate with the name ‘W. RABBIT’ engraved upon it. She went in without knocking, and hurried upstairs, in great fear lest she should meet the real Mary Ann, and be turned out of the house before she had found the fan and gloves.

‘How queer it seems,’ Alice said to herself, ‘to be going messages for a rabbit! I suppose Dinah’ll be sending me on messages next!’ And she began...
Pulsed-field Gel Electrophoresis (PFGE)

- PFGE separates organism by bands that were formed by an enzyme cleaving the DNA at certain reads.
- Different lengths, molecular weight, and bands.
Whole Genome Sequencing (WGS)

- WGS compares entire base sequences to other organisms and measures the difference.
- Fewer differences mean more relatedness.
Salmonella ser. Braenderup (JBPX01.0022, JBPX01.1206)

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Settings:
Reads trimmed using run_assembly_trimClean.pl with reads less than 40bp in length removed and reads with average quality less than 24.0 removed. LyveSET v1.1.4f used with mapping by SMALT. SNPs were called using Varscan at > 20x coverage, > 96% read support, and < 5 bp apart.

Reference:
Internal reference strain PNAS011287 assembled in CLC (48 contigs) without prophage masking.

2017-04-20
Salmonella Bareilly

8 cases from 8 states: [AZ, CA, ID, IL, MT, NC, NM, OH], matching *Salmonella* Bareilly PFGE pattern JAPX01.0211.

Onset dates ranged from August 3, 2015 to October 30, 2015.

Cases were 100% female and ages ranged from 20 to 59 years old, with a median age of 35 years.

No hospitalizations and no reported deaths.

Epidemiologic, laboratory, and trace-back findings indicated that imported frozen raw tuna was the likely source of this outbreak.

Tuna from the Indonesian firm of interest must present certification from a third-party lab of a negative *Salmonella* result before product may enter commerce.
Salmonella ser. Bareilly cluster 1511MLJAP-1 (JAPX01.0211), FINAL analysis

The methods used in the analysis of this sequence data are preliminary and remain under validation. Please email pfpe@cdc.gov if you plan to use/distribute this phylogeny further.

The hqSNP tree had phages masked, a reference of CFSAN000180, and was generated with Lyve-SET version 1.1.4c. Reads were cleaned with CG Pipeline (options: --no-singletons & --no-singletons/--min_avg_quality 25), SNPs were called with Varscan, and Lyve-SET was run with the following options: minimum coverage - 20, min alternative fraction- 0.95, and allowed flanking- 5 bp.

**NOTE:** The isolate 2016K-0018 has been removed from this analysis.
STEC O121

19 persons from six states [CA, ID, MI, MT, UT, and WA].

- Illness onsets May 1, 2014, to May 20, 2014
- 68% percent female. Among those persons with information, seven (44%) of 16 were hospitalized. No HUS, no deaths.

Seed lot used to grow clover sprouts linked to this outbreak may be contaminated.

Firm received new clover seed lot for germination.

Seeds never intended for human consumption, labeling issues and buyer/seller awareness issues.
STEC O157

19 persons from six states [CA, CO, MO, MT, UT, VA, and WA].

- October 6, 2015 to November 3, 2015
- 57% percent female. Among those persons with information, five were hospitalized, two developed HUS, and none died.

Majority (88%) of ill persons consumed Costco Chicken Salad

Three components in Costco chicken salad:

1. Chicken (rotisserie or bagged),
2. dressing,
3. celery/onion mix

Celery/onion mix positive by PCR

Likely contaminated lot prompted voluntary recall
Chicken salad review

Challenges
• Very difficult to identify unique item
• Recall bias
• National retailer, large distribution
• Specimen testing

Successes
• Excellent working relationship with partners
• Shopper card numbers
• Specimen collection
• Prompt recall
Importance of Collaboration

- Epidemiology
  - Reports & investigates cases
  - Collects exposure information
  - Implements control measures

- Laboratory
  - Analyzes and compares samples
  - Uploads into national database

- Environmental
  - Traces back distributors
  - Collects environmental samples
  - Applies regulatory action
Questions?
Dana Fejes, MPH
Epidemiologist
406-444-3049
dfejes@mt.gov