

IDAHO BUREAU OF LABORATORIES CLINICAL FORUM

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IDAHO DEPARTMENT OF
HEALTH & WELFARE

The Clinical Lab-Public Health Lab Food Safety Partnership

Christopher L. Ball, Ph.D.

The Idaho Bureau of Laboratories (IBL) is an active member of PulseNet USA (Figure 1), a network of federal, state, and local public health laboratories that use standardized DNA macrorestriction protocols and pulsed-field gel electrophoresis (PFGE) to generate DNA "fingerprints" for use in foodborne pathogen subtyping (<http://www.cdc.gov/pulsenet/index.htm>). In Idaho, infections caused by foodborne pathogens such as *Salmonella*, Shiga-toxin producing *Escherichia coli* (STEC), and *Shigella* are reported to the Office of Epidemiology and Food Protection (OEF) (<http://www.epi.idaho.gov>) or district health departments for further investigation. Clinical laboratories throughout Idaho also contribute to these investigations by voluntarily sending most of these bacterial cultures to the IBL for DNA "fingerprinting". The DNA "fingerprints" generated by the IBL, like those shown in Figure 2 (page 2), are then compared to both local and national databases to identify laboratory clusters. A laboratory cluster is defined as two or more strains with the same DNA "fingerprint" isolated within a sixty day surveillance period. Identification of laboratory clusters may indicate a common source of infection among case patients when combined with supporting epidemiological information.

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Figure 1: PulseNet USA logo

The rapid sharing of these data helps public health officials detect outbreaks of foodborne disease. Through the use of PFGE, case patients in Idaho were shown to be involved in several recent national outbreaks. For example, in September 2006, seven Idahoans were involved in a national STEC O157:H7 outbreak attributed to fresh bagged spinach (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5538a4.htm>). In October 2007, eleven Idahoans were linked to a national *Salmonella enterica* I, 4,5,12:i:- outbreak attributed to consumption of undercooked pot pies (<http://www.cdc.gov/salmonella/4512eyeminus.html>). And this summer, seven Idahoans were connected with the *Salmonella enterica* Saintpaul outbreak caused by contaminated tomatoes, jalapeño, and serrano peppers (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5734a1.htm> and <http://www.cdc.gov/salmonella/saintpaul/archive/082208.html>).

NEWS FLASH!

The QuantiFERON®-TB Gold-In Tube test is now offered by IBL.

- This interferon-gamma release assay (IGRA) is a blood test that can be used in all circumstances in which the Tuberculin Skin Test (TST) is used.
- QFT-G-IT eliminates false positive outcomes due to BCG vaccination and most non-tuberculous mycobacteria (NTM).
- A second patient visit for completion of the test is not required.
- Cost per test:
 - \$40.00 per test for routine testing
 - \$80.00 per test for STAT requests
 - \$9.00 per set of tubes
- Sample requirements:

QuantiFERON **NIL**, **TB ANTIGEN**, and **MITOGEN** tubes (3 dedicated tubes), **incubated at 35- 37°C for 16-24 hours** **within 16 hours of collection**
- Turnaround time: one week or less (volume dependent)

For additional information:

208-334-2235 ext. 253

or

www.statelab.idaho.gov

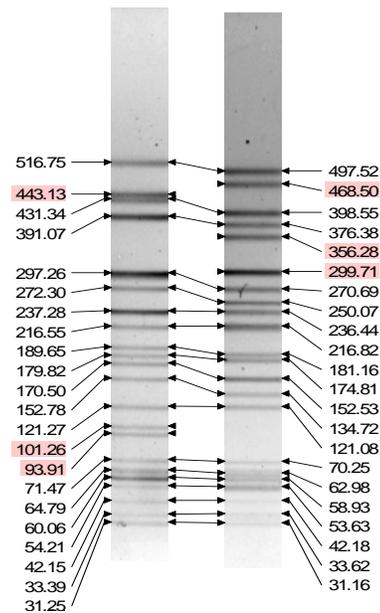


Figure 2: A comparison of DNA "fingerprints" between two different *E. coli* O157:H7 strains isolated within 8 days of one another. The DNA fragment sizes are shown in kilobase pairs. Unmatched bands are highlighted in pink. These strains have six band differences between them and a similarity score of 86%. At this level of similarity it is very unlikely that these case patients were infected from a common source.

As shown in Figure 3 (page 3), the number of voluntary submissions has steadily improved since 2004. We continue to see increases in the numbers of STEC and *Salmonella* isolates sent to the IBL and in many cases the number of isolates submitted is at or near the number of reported cases. As our DNA "fingerprint" databases become more comprehensive they are an increasingly valuable tool for understanding the dynamics of foodborne illness in the State. Clinical laboratories may not realize the key role they play in protecting the health of all Idahoans. It is their consistent submission of enteric isolates that allows Public Health to prevent illnesses associated with foodborne outbreaks and maintain the quality of our food supply.

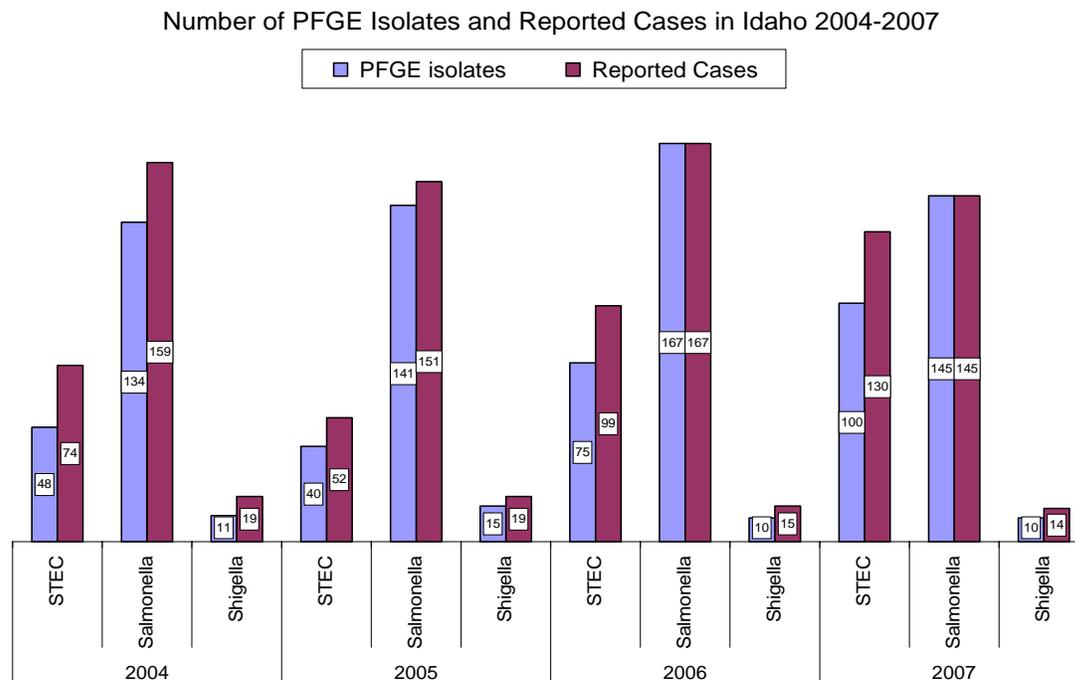


Figure 3: A comparison of isolates submitted by clinical laboratories for PFGE and the number of reported STEC, salmonellosis, and shigellosis cases in Idaho from 2004-2007.

Submissions to the Idaho Bureau of Labs Microbiology Lab

Amanda J. Bruesch, MS

It has recently been brought to our attention that not all of our clinical lab partners are aware of the many organisms that can be submitted for subtyping and epidemiologic investigation. We want to make sure that you are aware of which organisms we would be happy to receive and how easy it can be to submit the isolates. Not only are we available as a reference lab for difficult isolates, to confirm your lab's results, and for Shiga toxin testing of stools, but we also serve an epidemiologic role for the State of Idaho. By utilizing pulsed-field gel electrophoresis (PFGE), we examine isolates from your district to detect potential outbreaks across the state. This service can aid in the detection and speedy resolution of outbreaks.

Submission of isolates can be done with a minimal amount of work on your part. We are happy to accept your most recent plate or slant of a given isolate, rather than a new subculture - saving time and money.

The following organisms can be submitted to the state lab for PFGE and epidemiologic investigation:

- *Salmonella*
- *Shigella*
- *E. coli* (Shiga toxin-producing)
- *Campylobacter*
- MRSA & VRE

In many cases, isolates can be sent to us using an existing courier service - your reference lab or local health department. For additional information, call the Microbiology lab at (208)334-2235 x257.

Nocardia Surveillance Project with CDC

Amanda J. Bruesch, MS

Last year, Idaho was selected as a recipient of CDC's Epidemiology and Laboratory Capacity Grant for *Nocardia* surveillance. In response to anecdotal evidence of increasing drug resistance among *Nocardia* species in the United States, the CDC allocated funds to more systematically evaluate the national rate of *Nocardia* antimicrobial resistance. This information will help protect people from the potentially severe consequences of treatment failures due to resistance development. This short term surveillance project was designed to identify *Nocardia* isolates from all regions of the United States, determine the timing of isolation within the course of disease, record treatment measures and outcomes, and verify resistance patterns.

The IBL identified all *Nocardia* isolates to species level by 16S rRNA gene sequence analysis and sent them to CDC for susceptibility testing. The study is still in progress, with the collection of some clinical information still pending, but the data returned so far has indicated some interesting antimicrobial resistance patterns. The antibiogram below shows the percent susceptibility patterns for the three species of *Nocardia* isolated from patients in Idaho. When all of the clinical information is collected, CDC will issue final reports detailing regional resistance patterns. These reports can be used to compare Idaho's results with others from states in our area.

Table 1: Antibiogram of percent susceptibility in *Nocardia* species isolated from Idaho.

species	n	AMI	AMP	Cax	CLA	MIN	SXT	IMP	AMC	CIP	LNZ	VAN
<i>cyriaciageorgica</i>	6	100	0	100	0	0	100	100	33	0	100	0
<i>farcinica</i>	3	100	0	66	0	0	66	100	100	66	100	0
<i>nova</i>	2	100	50	50	50	0	100	100	0	0	100	0

n = Number of isolates tested, AMI = Amikacin, AMP = Ampicillin, Cax=Ceftriaxone, CLA=Clarithromycin, MIN=Minocycline, SXT=Trimethoprim/Sulfamethoxazole, IMP=Imipenem, AMC=Amoxicillin/Clavulanate, LNZ=Linezolid, CIP=Ciprofloxacin, VAN=Vancomycin