THE LABYRINTH ISDH LABORATORY NEWSLETTER

Indiana State Department of Health Laboratories

Volume 1, Issue 1

March/April 2009

ISDH Enterics Lab investigates recent Salmonella/ Peanut Butter Outbreak

Ten Indiana cases of Salmonella food poisoning linked to the current outbreak from peanut-containing products have been identified by the ISDH laboratory to date. The lab was asked by the Food and Drug Administration to help test peanut products from North Carolina in addition to monitoring the situation in Indiana.

The clinical testing capabilities of the ISDH Enterics Lab include the isolation and identification of such pathogenic bacteria from human specimens. These are usually stool specimens taken from the patient but can also be pure bacterial cultures from the victim's stool, blood or urine. The Enterics area of the clinical microbiology laboratory is staffed primarily by two senior microbiologists and one supervisory microbiologist. This staff has more than 33 years combined work experience in enteric microbiology.

The Enterics Lab isolates and identifies many food-borne bacteria pathogens such as Salmonella, Shigella, E. Coli and Campylobacter. Once pure bacterial colonies are isolated from the specimen, they are given the battery of biochemical tests to identify the type of bacteria. The isolates are then subjected to more biochemical testing and serotyping to further identify the specific strain of the bacteria.

Serotyping along with PFGE (Pulsed Field Gel Electrophoresis) is essential to investigating and tracking food-borne outbreaks. Especially the Salmonella Typhimurium outbreak linked to peanut butter and peanut butter containing products that is currently being investigated. Knowing the specific strain of bacteria infecting the patient allows us to link cases infected with the same strain and to determine possible sources of the outbreak.

Since January 2009, the Enterics Lab has identified 47 specific cases of Salmonella from human cases. Eighteen of these were Typhimurium, the same strain, as the nationwide outbreak. So far, ten of these have the same PFGE type as the national outbreak and are linked to it.

Written by: Jerry Hege

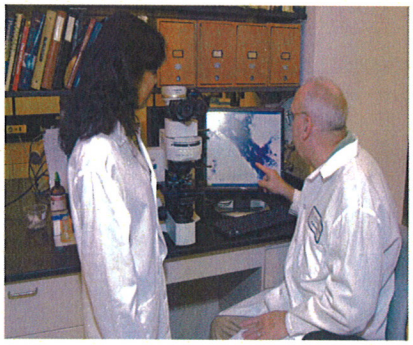


Photo source: Dan Axler, ISDH, OPA

Inside this issue: Find out how the ISDH Lab has tackled the Salmonella Scare.

DNA fingerprinting linking 10 Salmonella Cases 2

Investigating the Cracker Connection 2

Food Emergency Response Network (FERN) 3

Editorial Staff 4

ISDH Participates in SCACM Spring Meeting 2009 "SCACM – Always a Winner"

IThe ISDH Lab staff attended the Spring Meeting for SCACM, the South Central Association for Clinical Microbiology, on March 19-21, 2009, at the Indianapolis Marriott East. This was Co-chaired by Brent Barrett, long-time microbiologist in the Enteric Laboratory. Attendees included employees in Microbiology, Epidemiology, Management, and Training.

The ISDH Laboratories staffed a table in the Exhibition Hall where various educational materials were handed out and sentinel laboratory questions were answered by ISDH lab employees Shelly Matheson, Ellie Carter and Jim Hogan.

Shelley and Jim represented the ISDH training program at the meeting table. Shelley informed our visiting Indiana sentinel laboratorians how the ISDH Laboratories can help them be as prepared as possible to rule out agents of bioterrorism and to know when to refer them to the ISDH Laboratories. Jim Hogan enlightened hospital laboratorians with information on ASPR (Assistant Secretary for Preparedness and Response) grant money for hospital laboratories to use for a variety of their preparedness programs.

Ellie Carter represented the ISDH

(Continued on page 4)

Our Mission: The Indiana State Department of Health Laboratory partners with other public health agencies to provide timely and accurate information needed for surveillance and outbreak investigations to protect and improve Hoosier health.

PFGE links 10 Indiana cases to the ongoing Salmonella typhimurium outbreak associated with peanut butter.

Photo from ISDHL Share Point Collection

ISDH PFGE (Pulsed Field Gel Electrophoresis) laboratory performs standardized molecular subtyping (or "**DNA** fingerprinting"**) of clinical and** food derived pathogens. These include E.coli, Salmonella, Shigella and Listeria, utilizing a molecular technique called Pulsed Field Gel Electrophoresis or PFGE. PFGE facilitates comparison of relatedness of bacterial strains at the DNA level via creation of unique DNA fingerprints or patterns. Bacterial DNA fingerprints are matched against local and national DNA pattern databases revealing clusters of identical patterns indicative of developing foodborne outbreaks in Indiana. Bacterial DNA fingerprinting technology is also fundamental to rapid identification of common source outbreaks and separation of outbreak-associated cases from other sporadic cases.

Together with other public health laboratories, the ISDH PFGE laboratory is a part of CDC PulseNet – a nationwide surveillance and foodborne outbreak detection network. Active, real time surveillance through PulseNet has been critical to detection, epidemiological investigation, and containment of outbreaks in early stages of development, drastically reducing the number of ill and hospitalized people both state and nationwide. In 2008 our PFGE laboratory detected and assisted Epidemiology Resource Center in investigation of Indiana cases associated with national Salmonella St. Paul outbreak and several local Salmonella and E.coli clusters. In 2009, PFGE DNA fingerprinting technology has been instrumental in detecting and linking 10 Indiana cases to the ongoing Salmonella typhimurium outbreak associated with peanut butter.

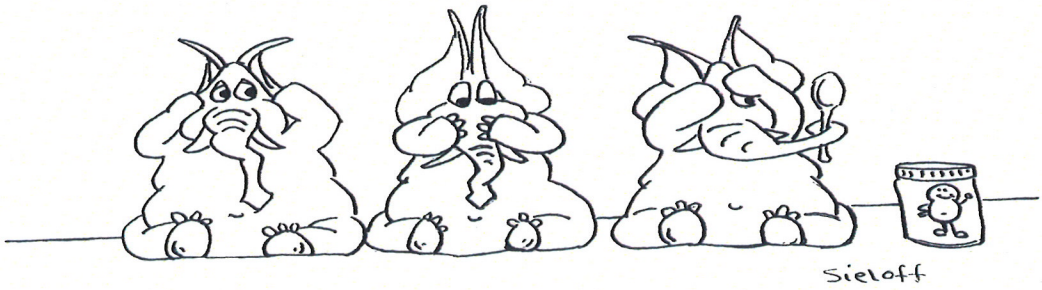
Written by: Robert Pawlak, Ph.D.

Investigating the Cracker Connection

"The primary food samples submitted to the lab for testing were peanut butter crackers collected from several patients that were previously diagnosed with Salmonellosis."

In January 2009, the ISDH Food Microbiology laboratories helped investigate the nationwide *Salmonella typhimurium* outbreak associated with peanut butter and related products. Part of the lab's participation involved the activation of the Food Emergency Response Network (FERN) nationwide to quickly identify the source of contamination. The primary food samples submitted to the lab for testing were peanut butter crackers collected from several consumers. Two patients had been previously diagnosed with Salmonellosis. Another sample was received as a consumer complaint thru the ISDH Food Protection Division. The primary method and instrument used was the MiniVidas (Biomerieux) which has become accepted within the FERN community for its efficiency and reproducibility. In addition, results are normally reportable within 24 hours. The traditional methods require approximately 48-72 hours to get the first presumptive result. All of the samples received and processed by the ISDH laboratories were reported negative for the presence of Salmonella species. If a positive had been isolated and identified, the ISDH Laboratories has the capability to

(Continued on page 4)



ISDH Lab assists The Food Emergency Response Network (FERN)

The recent food-borne illness outbreaks have been a major concern. The outbreaks involving bacterial contamination of fresh produce and processed foods and the suspected melamine contamination of numerous products imported from China have illustrated the importance of a nationwide network of local, State and Federal public health and agricultural laboratories. The Food Emergency Response Network (FERN) was formed to meet this critical need. It includes three basic areas of food testing expertise: Chemistry, Radiochemistry and Microbiology.

The Microbiology component is currently administered and directed by the United States Department of Agriculture (USDA) and Food Safety and Inspection Service (FSIS). The US Food and Drug Administration (FDA) directs the operations in the areas of Chemistry and Radiochemistry. As of February 18, 2009, 156 labs in 50 states and Puerto Rico have been accepted into the FERN. The Indiana State Department of Health (ISDH) Laboratories is a recognized participant in all three of the disciplines. Furthermore, the ISDH Laboratories has been the recipient of financial awards through the USDA-FSIS FERN Microbiology Cooperative Agreements each year since they were first awarded in 2005. These monies have been used to purchase the instrumentation and necessary supplies to perform the most current rapid methods for the isolation and identification of the prevalent food-borne bacteria, viruses and biological toxins. Formal training in these new testing protocols has also been funded through the cooperative agreements.

FERN's ability to contribute to expanding the testing capacity of the primary investigative laboratories during a nationwide food borne illness outbreak investigation was clearly illustrated during the *Salmonella st.paul* outbreak in late Spring and Summer of 2008. The early focus was on fresh tomatoes, however, as the investigation progressed, other fresh produce including peppers and cilantro were being considered.

To perform nationwide testing of these products during a very short time, FERN was "activated." Specifically, the member labs that had the demonstrated capability and capacity to perform the requested testing of fresh produce for Salmonella and the willingness to participate were enlisted to assist the FDA and USDA in the investigation. The ISDH Laboratories was a participant. Samples of fresh peppers and cilantro were collected within and outside of Indiana and submitted for Salmonella testing. The data collected by Indiana and other participants was submitted and assembled in a national database located in FERN's electronic information center, eLEXNET. Through the national effort of FERN , the culprit produce was rapidly identified as fresh peppers rather than tomatoes.

Recently, some of the FERN member laboratories have been involved in a more limited basis in the ongoing investigation of the Salmonella in peanut butter outbreak. Much of the testing is being directed to identifying which products may have been affected. The ISDH Laboratories have participated on a limited basis. FERN has not been formerly "activated" since the suspect organism and the source have been identified.

The Chemistry area of FERN has been recently active in the investigation of the suspected contamination of a wide range of processed food products that use dried milk imported from China. The suspect contaminant is melamine. This chemical was added to the milk to illegally increase the nitrogen content, which is used to calculate the protein content.This is a parameter that affects the monetary value of the product. The products identified as possibly being affected include but are not limited to infant formulas, coffee creamer, etc. During the initial investigation of the suspected melamine contamination of infant formula in October 2008, seven FERN labs analyzed 98 samples forwarded on from FDA labs and found two positives. The extra testing capacity of the FERN members has assisted in the FDA in working through the backlog of samples collected in the ongoing investigation of identifying food products that may have been affected. So, far, 13 FERN labs have tested 247 samples and have found melamine or related analogs in nine samples. The ISDH Laboratories has offered its services to the FERN but has not yet been selected to participate in any nationwide surveillance study.

Written by: Tom Cronau, M.S.

The food lab identifies many food borne bacteria pathogens such as Salmonella, Shigella, E. Coli and Campylbacter.

Photo source: Dan Axler, ISDH, OPA

In order to perform nationwide testing of these products during a very short period of time, the FERN was "activated." Specifically, the member labs that had the demonstrated capability and capacity to perform the requested testing of fresh produce for Salmonella and the willingness to participate were enlisted to assist the FDA and USDA in the investigation.

Indiana State Department of Health Laboratories

550 W 16th Street
Indianapolis, IN 46202

Phone: 317-921-5500
Fax: 317-927-7801
E-mail: rdreher@isdh.in.gov

The Indiana State Department of Health supports Indiana's economic prosperity and quality of life by promoting, protecting and providing for the health of Hoosiers in their communities.

We're on the web:
www.statehealth.in.gov

The LAByrinth

Is published bi-monthly by the editorial staff of Indiana State Department of Health Laboratories.

LAByrinth: Production Manager: Renee Dreher

Editorial Board: Judith Lovchik, Ph.D., D (ABMM)
Dave Dotson, M.S.
Tom Cronau, M.S.
Robin Bruner, B.S.
Lixia Liu, Ph.D.
Ellie Carter, MPH

Director: Judith Lovchik, Ph.D., D(ABMM)

Cracker connection-continued

(Continued from page 2)

perform the necessary serotyping to further identify the organism. PFGE analysis would have then been performed and the results entered into the national PULSENET database to see if the Salmonella found was the same or similar to the one associated with the nationwide outbreak. Having the capability to perform the entire testing process from the isolation from the food or clinical specimen and identification to PFGE analysis is a valuable asset of the Indiana State Department of Health Laboratories.

Written by: Hesham Elgaali, Ph.D.

SCACM Spring Meeting 2009

(Continued from page 1)

Written by Shelley Matheson

outreach program by answering sentinel laboratory questions about our program areas and advised on the new Communicable Disease Rule. In addition, JayThomas Read, an ISDH microbiologist in the Bioterrorism Laboratory, presented a poster entitled "Enterovirus: Sequencing in Public Health."

The SCACM meeting included lectures by prominent national clinical microbiologists, workshops, exhibits and poster sessions for clinical microbiologists traveling from throughout the south central United States. There were many commercial vendors at the event as well as renowned keynote speakers. The SCACM Spring Meeting 2009 was remarkably successful and beneficial to those of us who were privileged to participate. We hope to encourage similar participation in the SCACM Fall Meeting.

Pictured here: Jim Hogan, Ellie Carter and Shelley Matheson at the annual SCACM Spring Meeting