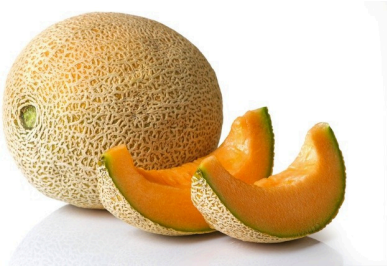
April/May/June 2012 Issue No. 18

The LAByrinth

Indiana State Department of Health Laboratories Newsletter

Colorado Cantaloupe Contamination Calamity

By Elizabeth Church, M.S.



(Photo courtesy of Layland Masudavia Shutterstock)

Listeria monocytogenes is the causative agent of listeriosis. This Gram positive rod is commonly found in the environment, and humans usually acquire it by consuming contaminated food. Symptoms of listeriosis are non-specific and occur in many common illnesses. A person with listeriosis usually has fever and muscle aches, often preceded by diarrhea or other gastrointestinal symptoms. Invasive listeriosis most often occurs in the elderly and those with weakened immune systems. Infection can cause febrile gastroenteritis, sepsis and meningoencephalitis. Furthermore, listeriosis in pregnant women is a particular concern because it can result in fetal loss, premature labor or neonatal infection. In most cases, antibiotics can be an effective treatment.

Listeria monocytogenes is one of the organisms included in the Indiana Communicable Disease Rule. In addition to reports of cases from physicians and hospitals, clinical laboratories are required to submit isolates to the Reference Bacteriology Laboratory at ISDH. Each isolate is tested with a series of biochemical tests to confirm that it is *L. monocytogenes*. Once identification of the bacteria is completed, isolates are forwarded to the Molecular Laboratory at ISDH for pulsed-field gel electrophoresis (PFGE). The pattern produced from performing PFGE is electronically submitted to a national database, PulseNet. This is the national molecular subtyping network for foodborne bacterial disease surveillance which compares the patterns for similarity in order to detect disease clusters. Following confirmation, the Reference Bacteriology Laboratory also sends the isolate to the Centers for Disease Control (CDC) for serotyping. In addition to patient isolates, the Reference Bacteriology receives isolates of Listeria from the Food and Dairy Laboratory at ISDH. These isolates from food are also identified through confirmation tests and then forwarded to the Molecular Laboratory for PFGE.

There have been isolates from Indiana that have been connected to national outbreaks. A recent outbreak was linked to consuming melon. On September 2, 2011, the Colorado Department of Public Health and Environment notified the CDC of seven cases of listeriosis reported since August 28. On average, Colorado reports two cases of listeriosis annually

(continued on next page)

Indiana State Department of Health Laboratories

Gregory N. Larkin, M.D.
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Laboratory Services

Our Mission:

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

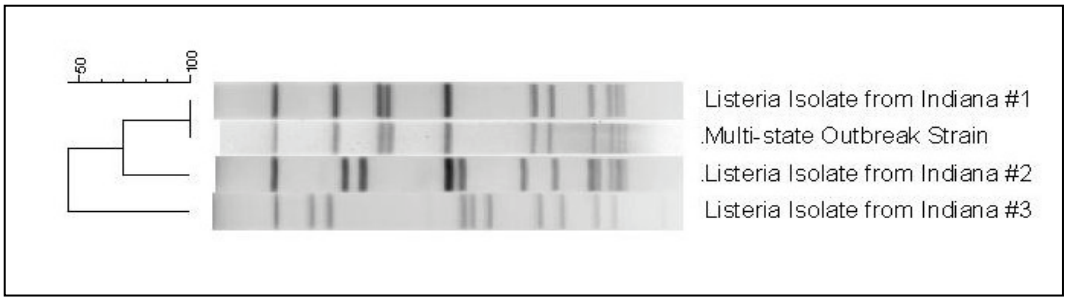
Inside this Issue:

Colorado Cantaloupe Contamination (*continued*)

in August. All Colorado patients reported eating cantaloupe in the month before illness began.

The CDC launched an investigation and used data collected through PulseNet to determine that four serotypes were involved. Analysis of patient interviews indicated that cantaloupe consumption was strongly associated and cantaloupes purchased by patients were from Jensen Farms in Colorado. All four outbreak strains of *L. monocytogenes* were isolated from cantaloupe samples from patients' homes or from samples of Jensen Farms cantaloupe collected from grocery stores and the farm. On September 14, the farm issued a voluntary recall of its cantaloupe.

The final update given by the CDC in December 2011 concluded that there were 146 persons from 28 states infected with outbreak-associated strains of *L. monocytogenes*. Thirty deaths were reported and one woman pregnant at the time of illness had a miscarriage. Most ill persons involved were over 60 years old and most were hospitalized. Fifty-eight percent of ill persons were female. Seven of the illnesses were related to a pregnancy; three were diagnosed in newborns and four were diagnosed in pregnant women. In Indiana, three isolates of *L. monocytogenes* were linked to the outbreak.



A comparison of DNA "fingerprints," or patterns, from Listeria isolates submitted to ISDH. Isolate #1 matches the multi-state outbreak strain. (Photo courtesy of Mark Forster)

This outbreak had several unusual features. This was the first listeriosis outbreak associated with melon. Also, four widely differing PFGE pattern combinations and two serotypes (1/2a and 1/2b) were associated with the outbreak. This outbreak was also unusually large; only two U.S. listeriosis outbreaks, one associated with frankfurters (108 cases) and one with Mexican-style cheese (142 cases), have had similar totals. Produce is not often identified as a source, but sprouts caused an outbreak in 2009 and celery caused an outbreak in 2010. Finally, this outbreak has the highest number of deaths of any U.S. foodborne outbreak since a listeriosis outbreak in 1998.

Recommendations for preventing listeriosis are available at:

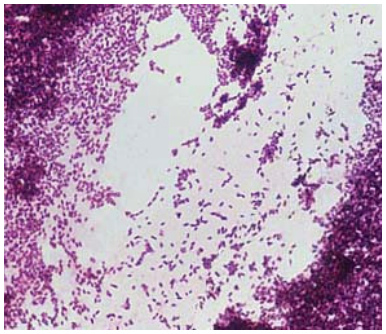
http://www.cdc.gov/listeria

Other links:

http://laist.com/2011/09/22/killer_cantaloupes_more_deaths_attr.php

http://textbookofbacteriology.net/Listeria.html

http://www.wikipedia.org/wiki/Listeria



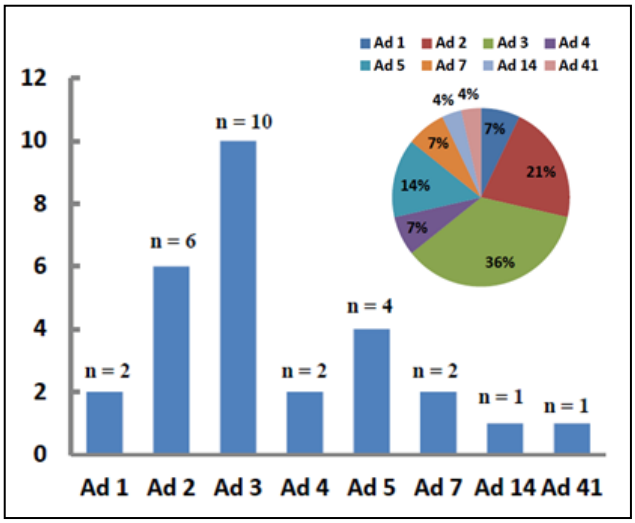
A Gram stain of Listeria

Human adenovirus serotypes detected by the ISDH Virology Lab

by Xian xuan Chi & Katie Masterson

Human adenoviruses (HAdVs) are responsible for acute and chronic diseases in both children and adults. They are medium-sized nonenveloped, icosahedral, double-stranded linear DNA viruses. While adenovirus associated respiratory disease can occur throughout the year, outbreaks of adenovirus infection occur most often in the late winter, spring and early summer. HAdVs are spread like the common cold, generally from person to person through coughing or sneezing. In humans, there are 57 accepted human adenovirus types (HAdV-1 to 57) in seven species (Human adenovirus A to G). Different serotypes have been found to correlate with specific disease syndromes, epidemiological settings and demographic risk groups. For example, serotypes 40 and 41 mainly cause gastroenteritis, while serotypes 1, 2, 3, 5, 6 and 7 are responsible for causing respiratory illness.

While virus isolation is one approach to detecting HAdV infections, molecular sequencing offers a highly sensitive and rapid approach for the identification of HAdVs in clinical samples. In 2011, the ISDH virology lab isolated more than 20 adenoviruses from clinical specimens. This is a large increase in the number of adenoviruses detected compared to previous years. By working closely with a local hospital laboratory this year, the virology lab has been able to significantly increase stock isolates for surveillance testing. Because of this, the ISDH has been able to learn more about adenovirus serotypes circulating within our community.



To accomplish this, a validation study was conducted to prospectively determine the distribution of HAdV serotypes in Indiana from patients with respiratory infections. As part of the validation study, 28 previously confirmed adenovirus positive specimens and/or isolates were sequenced. Specimen collection dates ranged from January 5 to March 15, 2012. Sequencing type analysis showed that 13 strains belonged to the species HAdV B (HAdV3 n=10, HAdV7 n=2, and HAdV14 n=1), 12 strains belonged to the species HAdV C (HAdV1 n=2, HAdV2 n=6, and HAdV5 n=4), two strains belonged to the species HAdV E (HAdV4 n=2) and one strain belonged to the species HAdV F (HAdV41 n=1). Overall, eight different serotypes were detected. Based on the data, the most common adenovirus serotypes from specimens collected during the first three months of 2012 were HAdV3 (n = 10, 36%) and HAdV2 (n=6, 21%). This validation study enabled us to draw a general picture of the common adenovirus serotypes circulating within the state as well as provided important surveillance data to epidemiology and other clinical partners.

A Look Inside the Containers Laboratory

By Tom Cronau

The hard-working members of the ISDHL Containers Section—Sharon Garrett and Engra Castiglione.

The Containers Section of the Indiana State Department of Health Laboratories (ISDHL) provides key support to numerous clinical and environmental testing areas of the ISDHL as well as the ISDH program areas being served. Currently, the staff of the Containers Section consists of two employees, Engra Castiglione and Sharon Garrett. Depending on the specific assignment, staff from other areas of the Laboratories may assist in the assembling of sample collection/submission kits. This is particularly important in the case of a disease outbreak investigation requiring a large number of clinical samples being collected over a short period of time. The extra help is also critical when dealing with a large demand for drinking water sample collection/submission kits, such as occurred in June 2008 when extensive flooding threatened the private wells of consumers in numerous counties in Indiana.

The clinical specimen containers assembled at ISDH can be classified into two basic types. These types are either kits for shipping serology samples or kits which include a specimen collection device such as a naso-pharyngeal swab along with an appropriate transport media. A pre-addressed shipping container is provided to send the collected sample to the ISDHL. It is very critical that the shipping containers are assembled and labeled to be in compliance with the strict Department of Transportation (DOT) and U.S. Postal Service (USPS) shipping regulations for packaging Category B clinical specimens and then sending to the ISDHL for analysis. The ISDHL does not provide shipping containers for Category A infectious substance isolates. It is the responsibility of the submitter to properly package and ship such specimens to the ISDHL.

The pre-addressed shipping containers are provided for shipping serological specimens for HIV, Hepatitis and Syphilis. These containers are only sent to submitters approved by the appropriate ISDH program area. Each type of specimen shipping container is provided with a uniquely colored shipping label which aids ISDHL staff in the Central Receiving area in sorting the incoming mail/shipments for pickup by the appropriate testing area in the lab. The submitter is responsible for the collection device.

Specimen collection kits and pre-addressed shipping containers are provided for TB sputum samples, stool specimens for Enterics and Parasitology, and nasal pharyngeal swabs and transport media for Pertussis and Influenza. In the case of the TB and Influenza kits, ISDHL also provides return shipping labels, UPS or FedEx, at no cost to the submitter to ship the samples back to the ISDHL overnight. The appropriate ISDH program areas provide the funding. However, it is the responsibility of the Containers staff, in the case of UPS expenditures, to accurately document the fund center for every kit sent out by the ISDHL via UPS using a computerized work station in the Containers area and a software application, WorldShip, provided by UPS. During calendar year 2011, over 22,000 clinical specimen collection/submission kits were sent out Statewide.

Environmental sample collection/submission kits which are primarily for the collection and submission of drinking water samples represent the other large segment of the ISDHL Containers workload. Private and public drinking water suppliers, local health departments and other State agencies request or order EPA approved drinking water sample collection/submission kits on a daily basis. A separate kit is required for each test. The tests offered include Bacteriology, Total Nitrate/Nitrite, Fluoride, Sodium and Nitrite. A sample submission form supplied with a unique barcode label is provided with each kit. Failure to submit or improperly complete the submission form with each sample may result in the sample being rejected. The fee is not refunded in those cases.

During calendar year 2011, approximately 38,000 drinking water sample collection/submission kits were sent out. A copy of the Water Test Kit Order form and a Frequently Asked Questions (FAQs) list is available on the ISDHL website at www.in.gov/isdh/24550.htm. The ISDHL Containers area may be contacted by e-mail at Containers@isdh.in.gov or at the following phone numbers: 317-921-5874 for environmental sample

kits and 317-921-5875 for clinical kits. However, it must be noted that pre-payment is required for the drinking water test kits and that there is an additional shipping and handling fee per package if the ISDHL is requested to send the kit to the consumer.

In July 2011, the Containers Section took over the packaging and shipping of Blood Lead materials from the ISDH Indiana Lead and Healthy Homes Program (ILHHP) for childhood lead poisoning prevention. There are approximately 60 health care providers (pediatric clinics and local health departments) that request Blood Lead supplies for submitting children's whole blood samples to the ISDHL for testing. The specimens are submitted as dried blood spots on lead free filter paper. While recycling and cost saving are popular topics now, the ISDHL Containers area has been working for more than 15 years with a small workshop group at the Indiana Women's Prison in reprocessing the shipping containers used for clinical specimen submission. This work provides a number of offenders with a productive work activity and reduces shipping material costs for the ISDHL considerably each time a shipping container and the reusable components are used multiple times.

The future of the Containers area will continue to bring change. The most significant recent change has been the shift to using electronic submission forms for many of the clinical tests. The reduction of the amount of paper submission forms has drastically reduced printing costs and required inventories of specific specimen submission forms. The next significant change which is being investigated and considered is the development of a statewide laboratory courier system to serve the major routine submitters of clinical specimens. That will greatly impact how we provide the specimen collection kits to the submitters and how the specimens are returned to the ISDHL for testing.

What has our Laboratory Outreach Team Been Up To?

By Kara Hammes

The last three months have been extremely busy for the ISDH Lab Outreach Team!

The Outreach Team attended and hosted a booth, April 3-4, at the annual Public Health Week conference sponsored by IUPUI. The information at the Lab's booth focused on food safety and included informational items such as the new food sample submission protocol, safe food handling fliers and information on patient specimen submission. This event was very successful, with up to 115 booth visitors.

On April 9, representatives from the ISDH Lab, the ISDH Surveillance and Investigation Division and the Department of Education presented a Measles Tabletop Exercise to 45 Riley Hospital medical residents. The exercise consisted of a presentation-style panel of experts that discussed the epidemiology, laboratory and school implications of a measles outbreak. The 2011 outbreak was used as the model for the tabletop scenario; information from the 2012 outbreak was also used as a recent example. A similar tabletop on pertussis was presented to the Riley medical residents last year and additional exercises on other report-able conditions are being developed.

The Outreach Team coordinated and participated in Communicable Disease Rule Trainings in District 8 and District 10 in Seymour on April 20 and Evansville on April 19, respectively. Tom Duszynski, the ISDH Director of Surveillance and Investigation, as well as local health department representatives participated in each of these trainings. The trainings were well received by the local health department, hospital laboratory and infection preventionists in attendance.

The Outreach Team attended the Public Health Nurse's Conference May 16 and 17. Kara Hammes served as the laboratory representative for a panel discussion entitled "Knowing Your ISDH Resources." The Outreach Team also had an exhibit booth that highlighted ISDH Lab resources, with a focus on foodborne illness testing.

Jyl Madlem, the Laboratory Program Advisor, was able to attend the Association of Public Health Laboratories (APHL) Annual Meeting from May 20-23. Jyl presented her findings on the state of the environmental laboratory component of the Indiana Laboratory System—a project funded by the APHL's Laboratory Innovations Grant. While at the meeting, Jyl was also able to attend conference sessions and participate in the environmental health special interest group.

If there is a conference or training at which you would like to have someone from the ISDH Lab as an exhibitor or presenter, please contact us at isdh-lab-info@isdh.in.gov and let us know!

Healthy U!

Are you trying to eat healthier? Buy better tasting, fresher food? Want to help keep the local economy thriving? Try a farmers' market.

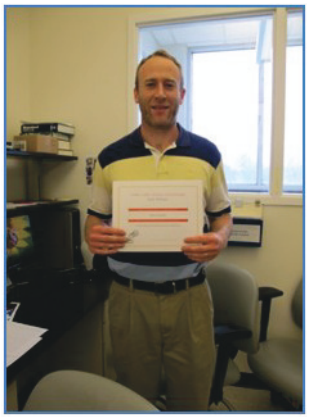
A farmers' market is a gathering of local vendors that sell produce that is locally grown and very fresh. People are often drawn to a farmers' market because of food quality, better prices and a great social atmosphere. The benefits of a farmers' market can be seen not only by you, the consumer, but also by the local economy. A recent study found that shopping locally kept twice the money in the community as opposed to shopping at a supermarket.

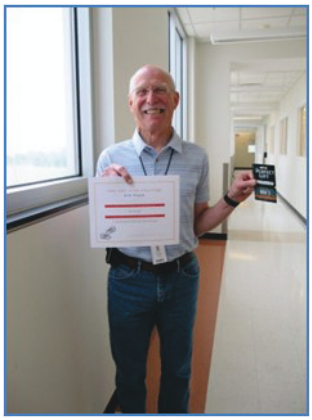
One such farmers' market is located on the Wishard Hospital grounds. Every Tuesday from May 18 through September 7, the market is open for business from 11 a.m. to 1:30 p.m. This is the third season for the Farmers' Market at Wishard, which boasts a variety of vendors, local farmers, bakers and beekeepers. A new addition for the third season is a booth referred to as "Au Bon Wishard," which features a unique dish, farmers' market chicken salad.

The Farmers' Market at Wishard is located behind the Bryce Building and only a 15 minute walk from the ISDH Labs. Lace up your shoes and head out for a *delicious* adventure!

And the winners are...

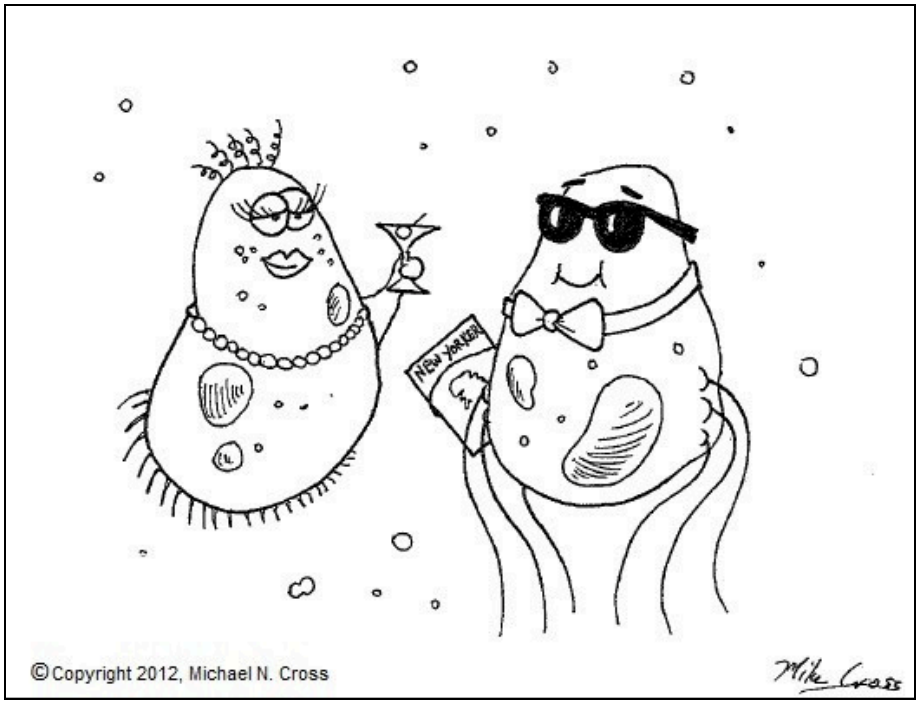
On April 4, the ISDH Labs kicked off the Spring 2012 Labs Steps Challenge. The four week challenge proved to be no challenge for the 21 participants! In total, over 4.3 million steps were logged! The top three walkers were (as pictured from left to right) Charlie Hostetter, Phil Zillinger and Sithra Kaliaperumal. Rounding out the top ten were Katie Masterson, Mark Glazier, Mike Oberthur, Liz Church, George Burk, Donna Chan and Stephanie Dalenberg.





Microtoon

By Mike Cross



"Cultured" Microoganisms

The LAByrinth

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Production Managers: Kirsten Long B.S., Michael Cross B.S.

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

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

Indiana State Department of Health Laboratories
550 West 16th Street
Indianapolis, IN 46202
Phone 317-921-5500
Fax: 317-927-7801

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