

NH Public Health Laboratories Newsletter

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NH PHL Offers First Course in Molecular Diagnostic Testing

The New Hampshire Public Health Laboratories (NH PHL) recently offered a course in basic molecular diagnostic laboratory testing to personnel from laboratories across the state interested in learning the theory behind molecular techniques and developing molecular testing in their own labs. The course was held October 20-22, 2008 at the NH PHL.

We were fortunate to have Dr. Elise Sullivan from the University of New Hampshire Medical Laboratory Sciences program join us to give an overview of molecular diagnostics and lead discussions about clinical molecular testing in hospital labs.



Emergency Preparedness Unit Supervisor Denise Bolton helps a student perform manual RNA extractions.

using molecular techniques and investigated in collaboration with the Centers for Disease Control and Prevention's PulseNet and CaliciNet.

Each day the students were able to gain hands-on experience performing the techniques they had studied in the lectures. They performed nucleic acid extractions, ran a PCR assay and a real-time PCR assay, conducted gel electrophoresis and observed DNA sequencing. Students were able to see the data they created and learned to analyze and interpret their data. Participants also toured the NH PHL facility and participated in group discussions about the advantages and challenges of performing molecular assays in their own labs.



Laboratory Scientist Chris Benton talks with students as they add extracted RNA to their PCR reaction tubes.

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Special points of interest:

- FERN labs used PFGE in large foodborne outbreak
- New England states participated in week long drill
- TB susceptibility methods evaluated on Bactec 460 and MGIT 960
- More melamine found in food products

The course included both lecture and lab sessions. The lectures focused on the theory behind molecular techniques such as nucleic acid extraction, polymerase chain reaction (PCR), real-time PCR, pulsed-field gel electrophoresis (PFGE) and DNA sequencing. Students also learned applications of molecular testing in the public health and clinical lab as well as how to introduce a molecular assay into a clinical lab. On the final day participants were given an update of recent disease outbreaks that have been tested at NH PHL.

Continuing medical laboratory education (CMLE) credits were available to participants by the Northeast Association for Clinical Microbiology and Infectious Diseases (NACMID). The NH PHL hopes to offer the course again this year.



Are we safe?

Laboratory management and technical staff have the responsibility of ensuring that they are working in a safe environment. There are numerous guidance documents available (College of American Pathologists [CAP] checklists, Occupational Safety and Health Administration [OSHA] regulations, International Organization for Standardization [ISO] guidelines, Biosafety in Microbiological and Biomedical Laboratories [BMBL] recommendations, etc.), but how can you really be sure your lab is a safe place in which to work? After all, we *are* there 8-10 hours a day.

The CAP general checklist (GEN.71350) asks, "Is there documented periodic review of safe work practices?" Some labs address this by having annual safety audits conducted by a safety team or a safety committee. The safety team should be composed of bench staff members because involving the general lab staff in this process has the added benefit of encouraging everyone to "think safety."

At the NH PHL we have found that having teams inspect units different from their own brings a fresh perspective and a new "pair of eyes" to identifying safety issues. Training the inspection team prior to sending them out, such as giving them advice on what to look for and what questions to ask, is very helpful. We use a safety inspection checklist as a guide for the safety team to follow during the audit. Reviewing the previous year's checklists and corrective action reports is also helpful.

Generally, there are common items in need of attention in many units that often reflect the facility and/or the practices of the laboratory. As the labs become busier and acquire more instrumentation, space and clutter issues may arise as well as the need to expand the electrical system. Accordingly, the safety team should

be aware of and look for the inappropriate use of extension cords, having inadequate bench space and/or using fume hoods and biosafety cabinets as storage areas.

Other common safety concerns include storage of flammables under sinks or on shelves, rather than in a flammable safety cabinet. A common standard used is to allow storage of 1 gal of flammables per 100 ft² of lab space or 2 gal of flammables in safety cans or safety cabinets per 100 ft². Your campus or facility safety officer should be consulted as your institution may have more stringent requirements. Safety teams should look for appropriate spill kits (chemical, biological and mercury) and make sure they are readily available and properly stocked. They should also check to see if all biological and chemical hazards, exits, evacuation maps, eyewash stations and safety showers have been properly identified and labeled.

A touch of Yankee common sense can also add to a safety audit. For example, a lab might want to re-think storing a 100 lb backup centrifuge on a shelf ten feet off the ground. Areas outside the lab should also be considered; a review of your institution's injury reports might show a trend in need of attention, such as slips and falls during winter months.

It is all too easy to become complacent about safety during the hectic day. A periodic walkthrough safety audit is an effective tool to encourage lab staff and management to keep safety in mind. The NH PHL has recently completed our annual safety audit and if you would like some advice on organizing one for your lab, please contact Daniel Tullo, Microbiology Program Manager, at (603) 271-4658.

Public Health Staff Spotlight

Interviewer:

Why did you choose to work in public health?

Carol Loring, Microbiologist II
Virology and Molecular Diagnostic Labs:

I love working in public health because my job is continually changing. Old microorganisms re-emerge, variant strains are identified and previously unrecognized microorganisms require new methods of detection and identification. The CDC is continually developing and validating testing assays for use in the state public health labs, so every season brings us new methods,

updated procedures and even changes in instrumentation. My work is stimulating, challenging and it contributes to the good health of citizens in New Hampshire!





PulseNet Identifies Large Foodborne Outbreak

This past spring, public health departments and laboratories in New Mexico, Texas and other states, along with the Centers for Disease Control and Prevention (CDC), identified the largest foodborne disease outbreak in the United States in the past decade. As of August 25, 2008, a total of 1,442 persons were stricken with this infection, 286 serious enough to require hospitalization. The infection, caused by a relatively rare serotype of *Salmonella*, may have contributed to two deaths. Several public health laboratories (PHLs) identified this strain as *Salmonella* Saintpaul.

The first reported cases were identified by the New Mexico Department of Health on May 22, 2008. They reported that four persons were infected with *Salmonella* Saintpaul whose DNA fingerprints were indistinguishable from each other by pulsed-field gel electrophoresis (PFGE). In the following weeks, this organism was reported from 43 states and Canada (Figure 1)(1). There were six cases attributed to this outbreak in New Hampshire.

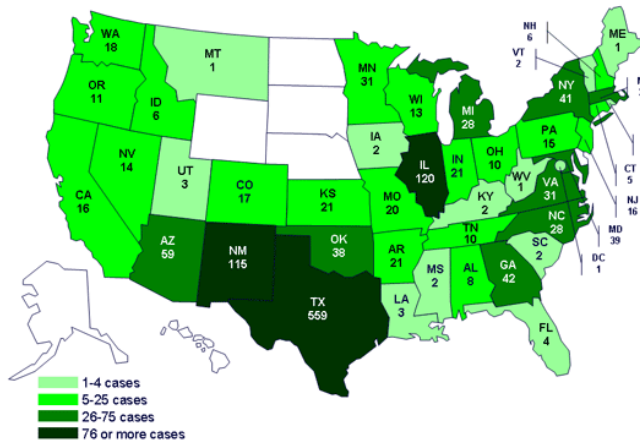


Figure 1. A map of the number of confirmed cases of *Salmonella* Saintpaul as of August 25, 2008.

PHLs were able to characterize this outbreak strain using PFGE, a process that utilizes restriction enzymes that cut genomic DNA of bacteria into a small number of fragments of varying lengths. These DNA fragments are too large to run on a conventional agarose gel, but can be resolved using PFGE. Pulsed-field gel electrophoresis facilitates the separation of these large fragments through an agarose gel by constantly changing the direction of the electrical currents during electrophoresis. The gel is then stained and the fragments are visualized using ultraviolet light. The resulting banding pattern is called a DNA fingerprint. The outbreak pattern is identified and named by PulseNet, a national electronic database of DNA fingerprints managed by the CDC (2). In the case of the *Salmonella* Saintpaul outbreak, pattern JN6X01.0048 was the primary restriction enzyme (*Xba*I) pattern name and JN6A26.0019 was the secondary restriction enzyme (*B*1n) pattern name. The PFGE pattern is uploaded into PulseNet, so any PHL can compare their patterns with the outbreak pattern (Figure 2).

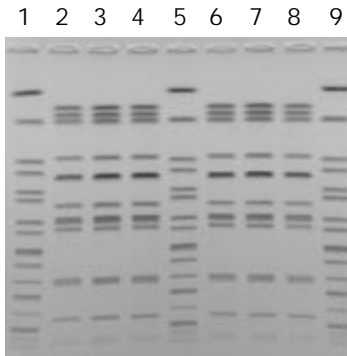


Figure 2. The DNA fingerprint of *Salmonella* Saintpaul (located in wells 2,3,4,6,7 and 8).

PulseNet plays a vital role in surveillance (identifying outbreaks) and the subsequent investigation of the outbreak. As with the Saintpaul outbreak, we are seeing a shift from the typical point source, or "church supper" outbreak, which is relatively easy to detect, to more diffuse, widespread outbreaks. Such outbreaks may occur in many communities, states and even countries with only a sporadic case in each community. Those cases probably would not have been recognized as part of a national outbreak without PulseNet. The practice of local hospital laboratories sending isolates of epidemiological interest to the PHL is invaluable to this process. Go to <http://www.dhhs.state.nh.us/DHHS/CDCS/LIBRARY/Policy-Guideline/report-diseases.htm> for a list of reportable diseases in New Hampshire.

As the investigation of the outbreak progressed, epidemiologic studies revealed associations between illness and more than one raw produce item. As a result of these associations, the Food and Drug Administration (FDA) released product alerts and conducted trace-back investigations of the produce items. Laboratory work performed by Food Emergency Response Network (FERN) laboratories indicated that jalapeño and serrano peppers grown, harvested or packed in Mexico were contaminated with the outbreak strain. The epidemiologic and laboratory results support the conclusion that jalapeño and serrano peppers were the vehicles that transmitted the pathogen. Tomatoes possibly were also a source of infection, particularly early in the outbreak. Contamination of produce items might have occurred on the farm or during processing or distribution; the exact mechanism of contamination has not been determined.

This food-borne outbreak appears to be over; however the NH PHL (a member of PulseNet and FERN) continues to conduct surveillance for outbreaks of disease using molecular DNA fingerprinting and the invaluable assistance of local hospital laboratory partners.

References:

1. "Outbreak of Salmonella Serotype Saintpaul Infections Associated with Multiple Raw Produce Items—United States, 2008." *MMWR* 57(34)(2008): 929-934.
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New England Exercise Tests All Hazard Lab Response

In February 2008, six New England states participated in a week-long, full-scale exercise to test laboratory response to both a chemical and biological event at the same time. The drill was planned by representatives from the NH PHL, the Health and Environmental Testing Laboratory of Maine, the Environmental Chemistry Laboratory of the Massachusetts State Laboratory Institute, the Centers for Disease Control and Prevention (CDC) and the United States Environmental Protection Agency (USEPA). Participating states included New Hampshire, Massachusetts, Connecticut, Rhode Island, Vermont and Maine. Public health and environmental laboratories were involved from each of these states.

The purpose of the exercise initially was to test the recently written and approved USEPA Regional Laboratory Response Plan (RLRP). The Northeast Environmental and Public Health Laboratory Directors (NEEPHLD) group decided that the public health laboratories would like to join the exercise and therefore a human exposure component was added to the drill. New Hampshire's bioterrorism preparedness planner from the Department of Safety Homeland Security Emergency Management office assisted in planning and executing the drill.

The scenario for the biological incident involved patients reporting to Spaulding Memorial Hospital Emergency Department (ED) in Plymouth, NH with symptoms of bloody diarrhea and severe dehydration following a weather event that resulted in rainwater and runoff entering the town water supply. The chemical incident involved patients arriving at the EDs of Elliot Hospital and Catholic Medical Center in Manchester, NH with acute gastrointestinal distress. As the events unfolded simultaneously, the Manchester and Plymouth hospitals were overwhelmed by the number of persons presenting to EDs with symptoms consistent with possible chemical and biological drinking water contamination. The NH PHL became overwhelmed by the number of laboratory samples being sent from the hospitals and requested assistance from state laboratories within New England.

The Clinical Microbiology Unit of the NH PHL evaluated personnel capacity and staff members were reassigned to areas where necessary. Staff assessed supply availability and reviewed emergency supply ordering protocols. Capacity to continue routine

testing was also evaluated and plans to stop and/or defer testing were developed. The Chemical Terrorism Unit of the NH PHL also evaluated capacity and capability to perform necessary methods. Chain-of-custody was documented for all samples received. Laboratory operations support was evaluated for specimen intake, packaging and shipping. The time required to package and ship samples was measured and results indicate that it took 45 minutes to prepare ten specimens to ship to the MA PHL. This was within the expected time frame of 30-90 minutes.

The ability to communicate within and among states was assessed. In NH, the PHL and Environmental Services Labs are separate entities so exercising communications was valuable. Also, the Laboratory Response Network (LRN) partners were sent communications using the Health Alert Network (HAN) as the events unfolded during the week. Inter-state communications included the request for assistance protocols; points of contact were established for hospital and state PHLs.

The weeklong exercise resulted in many lessons learned. First, technical staffing was sufficient, but lab support staffing was not, especially in the areas of sample intake, packaging and shipping. A Lab Incident Communications Tracking Form would improve communication and should be used immediately in any incident. This drill identified the need to develop such a form. The number of debriefings should be increased per day. The Lab Director must deputize one to two people at the beginning of the event and make it known to all partners that this has occurred. A Command Center physical location should be set up for the entire duration of the event so there is a location where information or status updates can be obtained.

In summary, state lab emergency response plans that work with the USEPA RLRP need to be reviewed and made as interoperable as possible. National Incident Management System/Incident Command System components must be incorporated in a Unified Command perspective that improves interoperability within each state's structure as well as among the New England states. NEEPHLD will continue to develop and refine a regional clinical laboratory response plan that addresses collaboration and surge capacity.

Lab Week 2009

National Medical Laboratory Professionals Week will be held April 19-25, 2009. This year the theme will be "Laboratory Professionals Get Results." Here at NH PHL we will have Wendy Lamothe, Clinical Microbiology Unit Supervisor and Jason Stull, Public Health Veterinarian for the State of NH, as guest speakers on vector borne diseases. Visit <http://www.ascls.org/conferences/2009NMLPW/index.asp> for more information on planning your celebration and purchasing promotional products. We hope your lab takes this opportunity to recognize the hard work you do all year long!





Sense & Sensitivities*

Mycobacterium tuberculosis is a very insidious organism and treatment for the disease can range anywhere from nine months to two years. Rapid test results are imperative for the physician to be able to treat the patient with the lowest possible dose of the drugs to which the organism is susceptible.

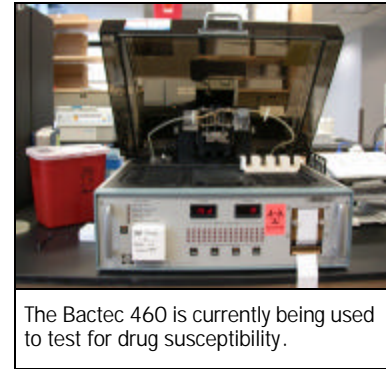
When first diagnosed with tuberculosis, a 'cocktail' of drugs is usually administered to the patient until the results of the drug sensitivities are completed. The cocktail of drugs consists of streptomycin (S), isoniazid (INH), rifampin (RIF), ethambutol (EMB) and pyrazinamide (PZA). The NH PHL Tuberculosis Unit uses these drugs at the following concentrations to determine susceptibility (Table 1).

Table 1. Drugs and the concentration used for susceptibility testing on the Bactec 460 instrument.

Drug	Concentration(s)
Streptomycin	6.0 μ /mL & 2.0 μ /mL
Isoniazid (I)	0.1 μ /mL
Rifampin (R)	2.0 μ /mL
Ethambutol (E)	7.5 μ /mL & 2.5 μ /mL
Pyrazinamide	100 μ /mL

Historically, these S.I.R.E. and PZA drugs are considered the first line drugs in the treatment of tuberculosis. Recently, streptomycin has been dropped from this list due to a rise in organism resistance. However, due to CDC requirements for TB proficiency testing, the NH PHL TB Unit continues to test for streptomycin sensitivity. A physician will usually begin a patient on INH, RIF, EMB and PZA until the sensitivity report is finalized. Once susceptibility is verified, the physician, working in conjunction with the TB Program of the NH Bureau of Disease Control (BDC), will ascertain the most appropriate drugs to use for the duration of treatment.

Currently at the PHL, we perform sensitivity testing using the Bactec 460. This method utilizes growth inhibition to determine drug resistance. For example, if an organism is resistant to streptomycin, then the organism will continue to grow even in the presence of the drug. As the organism metabolizes the nutrients in the media it releases radiometric carbon dioxide. This emission is monitored with the Bactec 460 instrument and is converted into a numeric growth index. This index is compared to the index of a control vial containing no drug and, depending upon the growth change, the organism is determined to be either sensitive or resistant to a drug.



The Bactec 460 is currently being used to test for drug susceptibility.

Testing with this method has advantages and disadvantages. One advantage is the speed with which the testing can be completed. In the past, sensitivity testing could take as long as three to four weeks using the agar proportion method whereas the Bactec 460 can decrease that time by half. One disadvantage of the Bactec 460 is the utilization of radiometric carbon dioxide. Although used in low quantities, it still requires restrictions on the ordering and handling of the test vials. Another disadvantage of the Bactec 460 is the use of needles required to inoculate the vials with both the drug and the suspension of organism. As a safety issue, in trying to minimize the use of needles in the laboratory, we are looking toward other methods that would eliminate some of the needle manipulation. In addition to these disadvantages, the company that makes and supports the use of the 460 is no longer making them. As the instrument ages (we have been using it for drug testing since 1994) it will be increasingly more difficult to get replacement parts and supplies. This made it imperative for us to look for another technology to supply our providers with rapid, reliable susceptibility testing. We turned toward our Mycobacterial Growth Indicator Tubes (MGIT).

We have been using the MGIT 960 system since 1999 to decrease the turn around time for positive cultures. The tubes contain 7mL of a modified Middlebrook 7H9 Broth that supports the growth and detection of mycobacteria. It also contains a fluorescent compound embedded in silicone on the bottom of the tube. The fluorescent compound is sensitive to the presence of oxygen dissolved in the broth. The initial concentration of dissolved oxygen quenches the emission from the compound, and little fluorescence can be detected. Later, actively respiring microorganisms consume the oxygen that, in turn, allows the compound to fluoresce. The MGIT 960 instrument scans the tubes hourly and signals if there is an increase in fluorescence indicating the growth of an organism. The tube is removed from the instrument and an acid-fast stain is performed. If the smear is positive for acid fast bacillus, further testing is performed to identify the organism.



The NH PHL is currently in the process of validating the MGIT 960 for drug susceptibility testing.

There are a number of advantages to the MGIT 960. Discontinuing the use of needles and working with radioisotopes is a safety advantage. Another advantage to the MGIT is automation. The work flow is automated once the tubes have been loaded onto the instrument. This is unlike the Bactec 460, which requires manual loading and unloading. When drug susceptibility tests are being performed with the 460 they must be manually read every day including weekends and holidays. And of course, we all know what happens in the lab on a Friday afternoon!

At the NH PHL, parallel studies between the Bactec 460 and the MGIT 960 have been completed and the data is being analyzed. A cost analysis of the MGIT 960 method will need to be completed and compared to that of the Bactec 460. It does appear that the drugs, growth indicator tubes and supplies for the 960 are more expensive than for the 460, but the technician time is greatly reduced. So, stay tuned for the follow up report on both the data and cost analysis. This should keep you on the edge of your chair for future issues of The NH PHL Newsletter.

* Not to be confused with Jane Austen's *Sense and Sensibility*. Although Jane Austen did not die of tuberculosis, many famous writers, composers, artists and politicians have succumbed to the disease. Go online and check out the famous people who have been sick with, or died from, tuberculosis. Some of the names will surprise you.

The Food and Drug Administration (FDA) approved the MGIT 960 for drug susceptibility testing around the end of 1999. The test is based on growth of the organism in a drug-containing tube compared to a drug-free tube, also referred to as the Growth Control. The MGIT then determines organism drug susceptibility by comparing fluorescence in the drug-containing tube to the fluorescence of the Growth Control tube. If the organism is resistant to a drug, it will consume the oxygen and the fluorescence will increase. If the organism is sensitive to a drug, it will be unable to grow and the fluorescence will be quenched. The same S.I.R.E. drugs are tested but with different concentrations (which are within the recommended critical concentration range) (Table 2).

Table 2. Drugs and the concentration used for susceptibility testing on the MGIT 960 instrument.

Drug	Concentration(s)
Streptomycin	1.0µ/mL & 4.0µ/mL
Isoniazid	0.1µ/mL & 0.4µ/mL
Rifampin	1.0µ/mL
Ethambutol	5.0µ/mL
Pyrazinamide	100µ/mL



Melamine in Food Products

The Food and Drug Administration (FDA) established the Food Emergency Response Network (FERN) in 2002 after the anthrax scare had subsided. It became evident that there was a need for a nationally integrated food laboratory response to combat terrorism aimed at our health, food supply and agricultural viability. More than six years later, one-hundred-and-forty-five federal, state and local labs from all fifty states and Puerto Rico are now a part of the FERN, which responds to food emergencies involving biological, chemical or radiological contamination. The FERN has expanded to include not only testing for acts of terrorism, but also domestic and international surveillance of our food supply.

Out of the 145 FERN labs, there are eleven FERN-Cooperative Agreement Chemistry Program labs (FERN-CAP). As part of the CAP, participating labs are given specific equipment and access to standard operating procedures (SOPs) via eLEXNET, the electronic laboratory exchange network. The cooperative agreement also includes funding for personnel, who are then trained on the equipment and the methods used for a general screen for contaminants. When specific needs arise, methods are made available by the FDA Forensic Chemistry Center. All of the CAP labs then analyze the samples using the same SOPs and equipment. When not in activated status, labs validate a variety of foods using the FERN screening methods, add testing for new contaminants as the FDA sees the need and maintain their state of readiness.

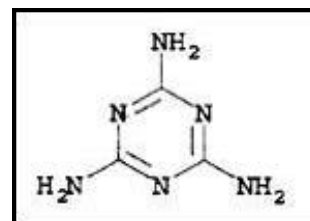
The Chemistry Unit of the NH PHL is one of the eleven FERN-CAP labs. In the spring of 2007, the FERN was activated to test for melamine in imported proteins. Many foods contain protein, which must be measured and reported on the product label according to US law. Proteins consist of amino acids joined together in long chains. Each amino acid contains at least one nitrogen molecule. Instead of measuring the amino acid content, it is customary for food manufacturers to measure the nitrogen content of the product and extrapolate from that the quantity of protein. This is done because it is faster, easier and cheaper to do so.

Unfortunately, the practice of measuring nitrogen rather than amino acid or protein content opens food production to fraud. It is possible for a manufacturer or a supplier of precursor materials to dilute the ingredient and substitute a chemical that is high in nitrogen to make it appear that the product has the expected amount of protein. For example, an unscrupulous processor might dilute milk and add a high nitrogen chemical to bring the nitrogen content, and the apparent protein level, back to the expected level. This can be dangerous due to the lack of the expected food composition as well as the toxicity of the additive.

Melamine ($C_3H_6N_6$) is a high-nitrogen chemical (Figure 3). There is a large surplus of melamine in China, the world's largest producer, so melamine is cheap. Health problems, such as kidney stones and renal failure, arise from melamine toxicity when melamine and cyanuric acid are present together. Cyanuric acid, a precursor to chemicals used to disinfect water and a melamine

byproduct, forms insoluble crystals when combined with melamine.

Figure 3. The structural diagram of melamine.



In the spring of 2007, melamine in pet food imported from China caused the deaths of many pets in the United States and the CAP labs were asked to help test for melamine in many types of imported food products. Inspectors collected a wide variety of protein products including noodles, soy, agar agar, fish food and many other foods, and shipped them to the NH PHL. We received the samples and reported the results within forty-eight hours. New Hampshire was one of only a few labs to report a positive sample, a fish food. All of these products were removed from the market.

More recently, melamine in baby formula has sickened more than 54,000 babies in China as well as caused the death of at least four (1). This past November, the FDA recalled imported Fresh and Crispy-brand Jacobina biscuits due to possible melamine contamination (2), and the Canadian Food Inspection Agency (CFIA) recalled Maliban Lemon Puff biscuits that were manufactured in Sri Lanka due to higher than allowable levels of melamine (3). Due to melamine contamination in baby formula manufactured in China, the FERN has again been activated in the US to test milk-containing food samples. We expect this will keep our food chemistry personnel busy for many months.

This program, with the instrumentation, training and personnel, has greatly enhanced the ability of the NH PHL Chemistry Unit to handle the occasional complaint of chemical contamination of food as well as to prepare for acts of terrorism.

References

1. "How China Let Melamine into the Food Supply." *Quality News Today* 13 Nov 2008 1 Dec 2008 <<http://www.asq.org/qualitynews/qnt/execute/displaySetup?newsID=5077>>.
2. "Melamine Fears Lead to Biscuit Recall." *Quality News Today* 4 Nov 2008 26 Nov 2008 <<http://www.asq.org/qualitynews/qnt/execute/displaySetup?newsID=5017>>.
3. "More Melamine Troubles in Canada." *Quality News Today* 10 Nov 2008 1 Dec 2008 <<http://www.asq.org/qualitynews/qnt/execute/displaySetup?newsID=5052>>.



2008 Arbovirus Season Recap

The arbovirus testing season in New Hampshire officially began on June 1st, 2008. Two mosquito control companies and the Manchester Health Department collected and submitted mosquito specimens to the NH PHL for testing beginning in June and continuing through the end of the transmission season (this year, October 25th). The NH PHL tested the mosquitoes for both eastern equine encephalitis virus (EEE) and West Nile virus (WNV). Approximately 10,000 mosquito pools were tested using a real-time Reverse Transcription Polymerase Chain Reaction (rRT-PCR) method. Eight mosquito pools tested positive for EEE from the towns of Brentwood, Danville, Newfields, Newton, Manchester,

Newmarket and Exeter. One WNV positive mosquito pool was identified from Kensington. All of these towns are in the south-east or south central area of the state.

The NH PHL also identified an EEE positive emu from the town of Barnstead.

In the calendar year 2008, 210 residents were tested for IgM antibody to EEE, WNV and St. Louis encephalitis virus. No human cases of arboviral illness were identified by NH PHL.

PHL Updates

Laboratory Requisition

In a previous publication we mentioned our laboratory requisition would be undergoing a review. We have found minimal revisions at this time, however one change will be the physician license number. It will now be addressed as the National Provider Identifier (NPI), which is a national standard identifier for healthcare providers for use in the healthcare industry. For more information on this go to: <http://www.cms.hhs.gov/NationalProvIdentStand/>.

Customer Satisfaction Survey

The customer satisfaction survey was well received and indicated to us a fair score of how the NH PHL services its customers and stakeholders. We will implement some of the ideas that many of you had for us. Once again, we appreciate your continued support and interest in keeping New Hampshire healthy!

New Testing

The NH PHL has begun a DNA sequencing study for norovirus surveillance and outbreak investigations. Once norovirus has been confirmed by real-time Reverse Transcriptase Polymerase Chain Reaction (rRT-PCR), the DNA will be sequenced to determine norovirus genotypes, which will help us to identify the circulating viral strain(s) in this region. DNA sequencing also enables us to determine genetic relatedness of norovirus, which is especially useful in investigating norovirus outbreaks in semi-closed communities such as long-term care facilities, schools, etc.

Administration

Denise Bolton has been appointed the new Emergency Response and Arbovirus Unit Supervisor. Ms. Bolton has been overseeing the development of the arbovirus lab since its inception in 2000. In her new role as unit supervisor, she will continue to oversee the development of arbovirus testing, as well as take on additional bioterrorism testing responsibilities. Most recently she is the leader of a limit of detection study in conjunction with the Association of Public Health Laboratories/Centers for Disease Control and Prevention Laboratory Response Network (APHL/CDC LRN).

