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~ Dr. Arthur L. Craigmill ~

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Hazardous Chemical Incidents in Schools - United States, 2002-2007

Chemicals that can cause adverse health effects are used in many elementary and secondary schools (e.g., in chemistry laboratories, art classrooms, automotive repair areas, printing and other vocational shops, and facility maintenance areas). Every year, unintentional and intentional releases of these chemicals, or related fires or explosions, occur in schools, causing injuries, costly cleanups, and lost school days. The federal Agency for Toxic Substances and Disease Registry (ATSDR) conducts national public health surveillance of chemical incidents through its Hazardous Substances Emergency Events Surveillance (HSEES) system. Mercury was the most common chemical released. The analysis found that 62% of reported chemical incidents at elementary and secondary schools resulted from human error (i.e., mistakes in the use or handling of a substance), and 30% of incidents resulted in at least one acute injury. **Proper chemical use and management (e.g., keeping an inventory and properly storing, labeling, and disposing of chemicals) is essential to protect school building occupants. Additional education directed at raising awareness of the problem and providing resources to reduce the risk is needed to ensure that schools are safe from unnecessary dangers posed by hazardous chemicals.** *(Emphasis added by Editor)*

During 2002-2007, a total of 43,766 events involving a chemical incident were reported to HSEES in 15 states. Of these, 423 occurred in elementary and secondary schools. The annual proportion of all events that were school related for each state was consistent across the reporting period and ranged from 1% to 3%. **School-related events most often resulted from human error** (62%) (e.g., improper chemical storage and unsafe, improper use of materials or equipment), equipment failure (17%) (e.g., broken hoses, valves, or pipes), or intentional acts (17%) (e.g., using homemade chemical bombs [bottle bombs] or 2-chloroacetophenone [i.e., mace or pepper spray pranks]). Among the 423 chemical incidents in elementary and secondary schools, 31% resulted in at least one acute injury and 52% resulted in an evacuation. Of the 74 incidents caused by intentional acts, 43% were associated with an injury.

A total of 895 persons were injured in the 423 school-related incidents. No injuries were fatal, but 11 persons were admitted to a hospital. Most injured persons received first aid on the scene, sought care from a private physician, or were treated at a hospital but not admitted. The health effects most commonly associated with the short-term release of carbon monoxide were nausea, dizziness, and headache. The release of acids and mace or pepper spray resulted primarily in respiratory and eye irritation. Most (86%) HSEES school incidents involved the release of only one chemical. Although mercury was the most common hazardous substance released (29%), only 2% of mercury-related incidents caused an injury. Conversely**, although 4% of releases were mace or pepper spray by students, these incidents were associated with a high rate of injury (86%) and evacuation (90%). Releases (usually spills) of hydrochloric acid, commonly found in chemistry classrooms, also resulted in a significant rate of injury (58%). Carbon monoxide releases, caused primarily from equipment failure in old air-conditioning and heating systems, also resulted in a high rate of incidents with injury (48%) and evacuation (81%).**

Editorial Note: During 2002-2007, a total of 423 chemical incidents in schools were reported by the 15 states participating in HSEES. The findings indicate that approximately 30% of chemical exposures resulted in acute injury. Mercury was the most commonly reported chemical released, but the rate of injury associated with mercury was low. This might be explained by the fact that HSEES captures acute health effects and mercury is only immediately toxic at extremely high doses, which would not be expected at schools. Before the dangers associated with mercury were fully understood, mercury was commonly used in thermometers, sphygmomanometers, and barometers and was used in science experiments in schools. **Eleven states (Indiana, Illinois, Maryland, Michigan, Minnesota, New York, North Carolina, Ohio, Rhode Island, South Carolina, and Wisconsin) have enacted legislation that bans or requires reduced use of mercury in schools. HSEES data indicate, however, that mercury is still present in many schools and spills continue to cause school lockdowns, dangerous exposures, and costly cleanups.**

Like an earlier analysis of 1993-1998 HSEES data, this analysis for 2002-2007 indicates that most school-related chemical incidents continue to be the result of mistakes in the handling or use of a substance. **These data suggest school staff members might benefit from additional training on how to use and handle hazardous chemicals to reduce injuries occurring at schools.**

To read the entire article, link to: MMWR Weekly, November 7, 2008

Illnesses and Injuries Related to Total Release Foggers - Eight States, 2001-2006

Total release foggers (TRFs), sometimes called "bug bombs," are pesticide products designed to fill an area with insecticide and often are used in homes and workplaces to kill cockroaches, fleas, and flying insects. Most TRFs contain pyrethroid, pyrethrin, or both as active ingredients. TRFs also contain flammable aerosol propellants that can cause fires or explosions. The magnitude and range of acute health problems associated with TRF usage has not been described previously. This report summarizes illnesses and injuries that were associated with exposures to TRFs during 2001-2006 in eight states (California, Florida, Louisiana, Michigan, New York, Oregon, Texas, and Washington) and were investigated by the California Department of Pesticide Regulation (CDPR) and state health departments participating in the SENSOR-Pesticides (Sentinel Event Notification System for Occupational Risk (SENSOR) program. During 2001-2006, a total of 466 TRF-related illnesses or injuries were identified. **These illnesses or injuries often resulted from inability or failure to vacate before the TRF discharged, reentry into the treated space too soon after the TRF was discharged, excessive use of TRFs for the space being treated, and failure to notify others nearby**. The findings indicate that TRFs pose a risk for acute, usually temporary health effects among users and bystanders. To reduce the risk for TRF-related health effects, integrated pest management control strategies that prevent pests' access to food, water, and shelter need to be promoted and adopted. In addition, awareness of the hazards and proper use of TRFs need to be better communicated on TRF labels and in public media campaigns.

Case Reports:

Case 1. In March 2008, a woman aged 38 years from Washington visited an emergency department with headache, shortness of breath, nausea, leg cramps, burning eyes, cough, and weakness after she was exposed to fumes from three TRFs (in 6-ounce cans) deployed nearly simultaneously by a downstairs apartment neighbor. One TRF each was set off in the crawlspace beneath the house, in the neighbor's apartment, and in the hallway. The building was an old house converted into apartments, with a single ventilation system connecting all apartments. The neighbor had orally notified some of the tenants but not the patient. The patient recovered completely within 3 days, and the illness was classified as low severity. The TRF dispensed a toxicity category III pesticide product that contained permethrin and tetramethrin as active ingredients.

Case 2. In September 2007, a man aged 34 years who worked as a maintenance worker at an apartment complex in Michigan forgot to disarm the smoke detector before activating a TRF. Because the building elevator shuts down if a smoke detector is triggered, the maintenance worker (without respiratory protection) reentered the mist-filled apartment to disarm the detector. He had onset of cough and upper airway irritation approximately 1 hour after exposure, contacted a poison control center, and did not seek

additional medical care. His symptoms resolved within 24 hours, and his TRF-related illness was classified as low severity. He was exposed to a toxicity category III pesticide product with pyrethrins, cyfluthrin, and piperonyl butoxide as active ingredients.

Case 3. In August 2007, a man aged 54 years in California simultaneously set off nine TRFs in his small 700 square foot (6,000 cubic foot) home. Each 1.5-ounce TRF can was designed to treat 5,000 cubic feet of unobstructed space and released a toxicity category III pesticide product containing cypermethrin. When the man returned 6 hours later, a strong odor prompted him to open the doors and windows and to vacate. Entering a second time 4 hours later, the man had onset of headache, dizziness, nausea, and vomiting. He visited an emergency department, where he was treated symptomatically for TRF-related illness. He completely recovered after 36 hours, and his illness was classified as moderate severity.

Surveillance Data: A total of 466 cases of acute, pesticide-related illness or injury associated with exposure to TRFs during 2001-2006 were identified. Median age of affected persons was 35 years (range: 0-90 years); 255 (57%) were female, and 55 (13%) were exposed while at work. Race information was available for 137 patients, of whom 101 (74%) were white, 17 (12%) were black, and 19 (14%) were of other races. Ethnicity information was available for 158 patients, of whom 31 (20%) were Hispanic. Three cases occurred among pregnant women, and approximately 44 cases occurred among persons with asthma.

A total of 372 (80%) cases were classified as low severity, 84 (18%) cases were moderate severity, and nine (2%) were high severity. One death was classified by the Washington State Department of Health as suspicious. (This death occurred in a female infant aged 10 months who was put to bed the evening of the day her apartment was treated with three TRFs. The infant was found dead the next morning.) Twenty-one persons were hospitalized for 1 or more days (range: 1-35 days), and 43 persons lost time from work or other usual activities because of their illness or injury.

A total of 394 (85%) TRF exposures occurred in private residences. Among the 388 cases for which information was available regarding who activated the TRF, 197 (51%) of the illnesses involved the person who activated the TRF.

Among the 463 cases for which information on the implicated TRF product was available, 449 (97%) occurred in persons who were exposed to products with pyrethrin, pyrethroid, or both as active ingredients. Health effects most commonly involved the respiratory system (in 358 [77%] cases). The most common factors contributing to exposure included an inability or failure to vacate before the TRF discharged, early reentry, excessive use of TRFs for the space being treated, unintentional discharge of a TRF, and failure to notify others nearby.

Editorial Note: TRFs are registered by EPA for use by home owners and others. When activated, the TRF cans are designed to empty their contents completely. No special training or licensing is required to use a TRF. Although numerous media reports in recent years have described injuries and property destruction resulting from explosions caused by activation of TRFs in the presence of ignition sources (e. g., gas pilot lights and electrical appliances, such as air conditioners and refrigerators, that cycle off and on) this is the first report in the scientific literature to describe the range of exposure circumstances and acute health problems associated with TRF usage.

TRFs generally release pyrethroids, pyrethrins, or both. Pyrethrins are insecticides derived from

chrysanthemum flowers (pyrethrum). Piperonyl butoxide and n-octyl bicycloheptene dicarboximide often are added to pyrethrin products to inhibit insects' microsomal enzymes that detoxify pyrethrins. Although pyrethrins have little systemic toxicity in mammals, they appear to possess some irritant and sensitizing properties and have been reported to induce contact dermatitis, conjunctivitis, and asthma. In addition, anaphylactic reactions and health effects involving the neurologic, cardiovascular, and gastrointestinal systems have been reported. Pyrethroids are a class of synthetic insecticides that are chemically similar to natural pyrethrins and have low potential for systemic toxicity in mammals. Signs and symptoms of pyrethroid toxicity include abnormal skin sensation (e.g., burning, itching, tingling, and numbness), dizziness, salivation, headache, fatigue, vomiting, diarrhea, seizure, irritability to sound and touch, and other central nervous system effects. Propellants and other solvents in the TRFs also might contribute to observed symptoms.

Toxicity category I = Highly toxic; Severely irritating

Toxicity category II = Moderately toxic; Moderately irritating

Toxicity category III = Slightly toxic; Slightly irritating

Toxicity category IV = Practically non-toxic; not an irritant

REF: MMWR Weekly, October 17, 2008

Outbreak of *Listeria monocytogenes* Infections Associated with Pasteurized Milk from a Local Dairy - Massachusetts, 2007

On November 27, 2007, a local health officer in central Massachusetts contacted the Massachusetts Department of Public Health (MDPH) to report listeriosis in a man aged 87 years. Pulsed-field gel electrophoresis (PFGE) performed on the patient's *Listeria monocytogenes* isolate produced a pattern indistinguishable from that of isolates from three other cases identified in residents of central Massachusetts in June, October, and early November 2007. MDPH, in collaboration with local public health officials, conducted an investigation, which implicated pasteurized, flavored and nonflavored, fluid milk produced by a local dairy (dairy A) as the source of the outbreak. This report summarizes the results of that investigation. In all, five cases were identified, and three deaths occurred. This outbreak illustrates the potential for contamination of fluid milk products after pasteurization and the difficulty in detecting outbreaks of *L. monocytogenes* infections.

Dairy A was a family owned and operated milk product pasteurizing, bottling, and processing facility

located in central Massachusetts; the dairy had operated for nearly 50 years. Raw milk was transported by tanker truck to the dairy A processing facility from dairy A's own farm (with nearly 300 cows) and from another, independent farm located 25 miles away. Dairy A produced various milk and nonmilk beverage products in glass and plastic bottles, including several varieties of flavored milk. Retail outlets were located at the dairy and the farm, but the bulk of the dairy's milk products were sold under dairy A's own name and other brand names through home delivery and at various retail establishments in Massachusetts. In addition, bulk cream was distributed to a bakery in Rhode Island, where it was used in cooked products.

Epidemiologic Investigation: On October 24, 2007, MDPH identified a listeriosis isolate (from patient 3) with a PFGE pattern indistinguishable from an isolate (from patient 1) submitted approximately 120 days earlier. The PFGE patterns associated with these patients had never been observed before in **Massachusetts** or in PulseNet (the national molecular subtyping network for foodborne disease surveillance). A review of available information on these two patients did not indicate a common exposure. On November 20, MDPH identified a third case (in patient 4) with an indistinguishable PFGE pattern. Attempts were made to interview this patient but were unsuccessful. On November 27, a fourth case (in patient 5) was reported to MDPH and, in the course of investigating that case, samples of coffee-flavored milk produced by dairy A were collected on November 29 from the patient's home for testing. In early December, MDPH determined that the clinical isolate from patient 5 had PFGE patterns indistinguishable from those of patients 1, 3, and 4. An epidemiologic investigation of patient 5 indicated exposure to milk produced by dairy A. On December 21, a *L. monocytogenes* isolate obtained from the milk sample taken from the home of patient 5 was confirmed to have a PFGE pattern indistinguishable from that of the isolates from the four identified listeriosis patients. MDPH then investigated all 11 cases of listeriosis reported during 2007 in **Massachusetts residents for whom no clinical isolates had been submitted to the State Laboratory Institute (SLI) of MDPH for PFGE analysis. The purpose of the investigation was to determine if any patients had exposure to milk products produced by dairy A during the 6 weeks preceding their illness. Telephone interviews were conducted with patients or next of kin. During this retrospective investigation, patient 2 was identified.**

Five patients had illness consistent with the case definition. All but patient 2 met the first case definition criterion; patient 2 met the second criterion. The median age of patients was 75 years (range: 31-87 years); three were male. All five patients were hospitalized. All three of the males (aged 75-87 years) died; they each had sepsis attributed to *Listeria* and died close to the time of their acute illness onset. The first case in a female was in a woman aged 31 years (patient 2) who had chorioamnionitis at 36 weeks' gestation. She delivered a healthy but premature infant. A placental culture was positive for *L. monocytogenes*. The second case in a female was in a woman aged 34 years (patient 4) who had fever and abdominal pain. She experienced a stillbirth at 37 weeks' gestation, and cultures of her blood, fetal blood, and placental tissue all were positive for *L. monocytogenes*.

Interviews were conducted with patients or patients' families using the CDC extended *Listeria* questionnaire. Patient 4 could not be interviewed. Of the remaining four patients, all but patient 3 were documented to have consumed products from dairy A during the 6 weeks preceding their illness. Patient 1 regularly consumed home-delivered, pasteurized skim milk produced by dairy A. Patient 2 reported drinking pasteurized 2% and whole milk produced by dairy A throughout her pregnancy. Patient 5 reported consuming pasteurized, coffee-flavored milk produced by dairy A.

Environmental Investigation: On December 17, evidence of *Listeria* growth was reported from the coffee-flavored milk sample from the home of patient 5. On December 21, this organism was confirmed to be *L. monocytogenes* **and matched the four clinical isolates by PFGE using the two restriction enzymes. The Massachusetts Food Protection Program (MFPP) inspected dairy A and collected 11 samples of unopened, flavored and unflavored milk products for testing on December 18, in response to the findings on December 17.**

MFPP returned to dairy A on December 26 and collected environmental swab samples from inside the processing facility. On December 27, SLI reported a presumptive positive *Listeria* sp. in a sample of unopened, coffee-flavored milk that had been collected from dairy A on December 19. In response to this finding, MFPP asked the dairy to voluntarily cease all operations and recall its dairy products; dairy A complied with this request on December 27. On December 30, SLI confirmed that *L. monocytogenes* with PFGE patterns identical to the outbreak strain was isolated from the sample of unopened, coffee-flavored milk.

After closure of dairy A and recall of its dairy products, approximately 100 additional environmental and product samples were collected by MFPP from the dairy's processing facility and adjacent retail store on January 2, 2008. One environmental swab from a floor drain in the finished product area, one skim milk sample, and seven flavored milk samples tested positive for *L. monocytogenes* and matched the outbreak strain by PFGE using the two restriction enzymes. Two additional environmental swabs and four additional samples of milk, both flavored and nonflavored, tested positive for seven distinct strains of *Listeria*, including three different *Listeria* species and three strains of *L. monocytogenes* with PFGE patterns that differed from those of the outbreak strain.

From December 28, 2007, to January 3, 2008, MFPP conducted a full environmental investigation in conjunction with the Food and Drug Administration and the local board of health. The dairy's records indicated that the plant's equipment met federal standards for time, temperature, and flow for effective pasteurization. The facility did not have an environmental monitoring program for *L monocytogenes*. This is not required by law, but often is implemented as a best practice by larger food processors of ready-to-eat foods. Contamination, as demonstrated by the positive environmental samples, was documented in close proximity to areas where hoses were used to clean equipment. On February 1, 2008, dairy A decided to permanently close the milk processing facility, citing an inability to assume the financial burden that mitigation would require.

Editorial Note: Sporadic cases of human listeriosis occur with an annual incidence of approximately 0.27 per 100,000 population in the United States. In Massachusetts, 25 to 35 cases are reported each year. Although **most listeriosis patients exhibit mild, acute febrile illness not requiring medical care, pregnant women, neonates, elderly persons, and those who are immunocompromised are most at risk for severe disease. In pregnant women, infection can lead to miscarriage and stillbirth**. Because only those patients with serious manifestations of infection seek medical care, most cases likely go undetected and detection of an outbreak or cluster is difficult.

In this outbreak, results of PFGE analysis indicated a common source for the *L. monocytogenes* found in the clinical isolates of four patients, six samples of flavored and nonflavored milk produced by dairy A, and the environment of the bottling facility of dairy A. The results of the PFGE analysis, in addition to the

illness onset dates of the linked patients, support the conclusion that extensive contamination occurred over an extended period.

Physical facility design, product flow, and maintenance procedures likely contributed to contamination of finished product in this outbreak. How the pasteurized milk products became contaminated is unclear, but because records indicate that pasteurization methods at the dairy were adequate, and given the expectation that pasteurization kills *Listeria* organisms, contamination of the product likely occurred after pasteurization.

Outbreaks of listeriosis associated with pasteurized dairy products are rare. This outbreak is only the third reported outbreak of human disease caused by *L. monocytogenes* in the United States in which pasteurized fluid milk was implicated. Health officials must be prepared to act quickly with public health interventions, such as closing a dairy, if epidemiologic and laboratory evidence indicates that cases have occurred and are associated with milk products.

REF: MMWR Weekly, October 10, 2008

Thallium Poisoning from Eating Contaminated Cake - Iraq, 2008

Thallium is an odorless, tasteless, heavy metal formerly used in rodenticides and still used in some manufacturing processes (e.g., electronics, pharmaceuticals, and glass). Thallium also has been used for intentional poisonings. Acute thallium poisoning produces gastrointestinal symptoms and signs, such as vomiting and acute abdominal pain, in the first few hours after ingestion, and initially is indistinguishable from other causes of acute gastrointestinal toxicity. However, within several days of ingestion, acute thallium poisoning often produces neurologic symptoms, such as extreme pain and acute muscle weakness ascending from the lower extremities, consistent with heavy metal toxicity. On January 22, 2008, 10 of 12 members in two families in Baghdad, Iraq, developed gastrointestinal symptoms; four of those 10 persons subsequently died from acute thallium poisoning, and five developed neurologic symptoms but survived. The Jordan Field Epidemiology Training Program investigated this cluster at the request of the World Health Organization (WHO) representative in Iraq. The preliminary investigation indicated this was an intentional poisoning, and law enforcement officials began a criminal investigation. **Physicians who see the sudden onset of painful peripheral neuropathy and hair loss in patients should consider the possibility of thallium poisoning.**

On January 22, 2008, 10 members of two families sought treatment at a health-care facility in Baghdad. All 10 of the ill patients were experiencing abdominal pain, vomiting, and dysphagia (difficulty in swallowing). Over the next 4 days, five of the patients developed neurologic symptoms and signs of varying severity (i.e., pain, abnormal sensations, and weakness, especially in the lower limbs). On January 26, the treating physician submitted specimens from the patients and a sample of a cake, which all 10 had

eaten, to the poison testing laboratory of the Iraq Ministry of Health in Baghdad. On January 27, the WHO representative in Iraq was notified that the laboratory had detected thallium qualitatively in patient specimens and the cake. One of the patients, a child aged 11 years, died on January 30.

On February 1, the nine surviving patients were evacuated to Amman, Jordan, to receive Prussian blue (ferric hexacyanoferrate) as an antidote for thallium poisoning, which was not available in Iraq. A second child, aged 2 years, died soon after arrival in Jordan, before therapy could begin. Prussian blue therapy was begun in the eight surviving patients 11 days after they had eaten the contaminated cake; however, two of the eight patients were already in coma with severe cerebral edema and subsequently died. Over the next 30 days, all six long-term survivors developed hair loss, and five of the six survivors developed muscle weakness and spasticity of the lower limbs, with differing severity.

An epidemiologic investigation was initiated on February 5, 2008. Investigators learned that the fathers of the two families (family A and family B) were board members of an Iraqi sporting club. The board held a routine meeting in the club's conference room in Baghdad at midday on January 21. The cake, divided into 10 pieces, was prepared by a local bakery and delivered to the board meeting as a gift from a former board member. However, the cake arrived late, after most board members had departed. The board members who remained (the fathers of two families) divided the cake and took the halves home to their families. No cake was eaten at the board meeting; the cake was eaten at both families' homes after the evening meal on January 21.

Family A was composed of seven members (father, mother, and five children); family B was composed of five members (father, mother, uncle, and two children). Ten cases of abdominal pain, vomiting, and dysphagia were identified among family members who consumed any portion of the cake on January 21. No other board members or their families reported illness, and no similar illnesses were found at the health facility in Baghdad or at nearby health facilities.

The overall attack rate was 83% (10 of 12 persons): six of seven persons in family A and four of five persons in family B. Four patients died. Food exposure histories were collected in Jordan through interviews with family members. Ten persons who ate portions of the cake on January 21 became ill; neither of the two persons who did not eat cake became ill. However, one of the two had tasted the cake icing and tested positive for thallium in blood and urine specimens. Six (60%) of the ill patients were male; four (40%) were female. The median age of the patients was 12.5 years (range: 2-40 years). The median onset of illness was 24 hours after exposure. An inverse relation was suggested between the amount of cake eaten and time to onset of symptoms. More rapid onset of illness occurred in persons who ate the most cake, and in adults. Of five patients who ate at least one piece of cake, onset of illness was a median of 16 hours after exposure; of five patients who ate half a piece of cake or less, median onset of illness was 48 hours after exposure. Among the four patients aged $\geq$19 years, median onset of illness was 14 hours; among the six patients aged $\leq$14 years, median onset was 24 hours. Fatality was not significantly associated with sex, age, the amount of cake eaten, or the time to illness onset.

By 30 days after ingestion, eight (80%) patients had experienced hair loss, which had begun within 7 days after eating the cake, and five (50%) still had neurologic deficits (e.g., lower limb muscle weakness and spasticity, with differing severity). Quantitative thallium levels were determined from blood and urine specimens of nine patients on the 16th day after eating any portion of the cake. Thallium was detected in all nine patients. Blood thallium levels were weakly correlated with the amount of cake reported eaten.

The father of family A, who did not become ill, but had tasted icing from the cake, had elevated blood and urine thallium levels.

Editorial Note: When ingested, thallium is a systemic poison that can produce multiple organ toxicity involving the gastrointestinal, neurologic, and cardiovascular systems. Among the distinctive effects of thallium poisoning are hair loss and painful, usually ascending, peripheral neuropathy (e.g., extreme pain, paresthesia, and weakness in distal extremities). In 1973, WHO recommended that thallium sulfate use as a rodenticide be discontinued because of its toxicity, and use in the United States for this purpose has been banned since 1975. Approximately 60%-70% of thallium production is used in the electronics industry, with the remainder being used in manufacturing pharmaceuticals and glass.

Prussian blue, a pigment discovered in the 1700s, acts as a sequestering agent for certain heavy metal ions and as an antidote to thallium poisoning. In 2003, the U.S. Food and Drug Administration approved the use of Prussian blue in 500 mg capsules as safe and effective for treatment of known or suspected internal contamination with thallium (radioactive or nonradioactive) or radioactive cesium.

Deliberate contamination of food during production and preparation is rare, but instances of intentional thallium poisoning have been reported. This report describes one of the largest known clusters of thallium poisoning.

REF: MMWR Weekly, September 19, 2008

Communitywide Cryptosporidiosis Outbreak - Utah, 2007

Cryptosporidiosis is a nationally notifiable gastrointestinal illness caused by chlorine-resistant protozoa of the genus *Cryptosporidium*. Fecal-oral transmission of *Cryptosporidium* occurs via ingestion of contaminated recreational water, drinking water, or food, or via contact with infected persons or animals (e.g., cattle). **Incidence peaks in late summer and coincides with the summer swimming season**. The number of nonoutbreak cryptosporidiosis cases reported nationally increased from 3,411 cases in 2004 to nearly 8,300 in 2007. This substantial increase (143%) mirrors the increase in the number of nationally reported cryptosporidiosis outbreaks associated with treated recreational water venues (e.g., pools, water parks, and interactive fountains): seven reported treated recreational water-associated outbreaks in 2004, 19 in 2006, and, as of September 5, 2008, provisional reports of 26 in 2007. This report describes a communitywide cryptosporidiosis outbreak in Utah that likely was associated initially with treated recreational water venues and subsequently with person-to-person transmission. *Cryptosporidium*'s ability to cause communitywide outbreaks, which is attributable to factors such as its chlorine resistance, underscores the need for more rapid implementation of control measures once an increase in case reporting is noted rather than waiting for an outbreak investigation to implicate a specific source of transmission. Such a response should include 1) pre-outbreak planning and preparation, 2) pre-outbreak

adoption of a disease action threshold (e.g., a twofold to threefold increase in cases over baseline), and 3) rapid mobilization of community partners to implement control measures once the threshold is exceeded.

The Utah Department of Health (UDOH) received 1,902 case reports of laboratory-confirmed cryptosporidiosis during June-December 2007, compared with an annual median of 16 reports of laboratory-confirmed cases during 2002-2006. All 1,902 cases met the outbreak-related case definition. The median age of patients was 9 years, and 32% (617) were aged <5 years; 51% of patients were female. Patients were residents of all 12 local health districts in Utah. Follow-up interviews provided additional data on 1,650 cases. Eight percent of patients were hospitalized. Illness onset dates were reported for 1,601 (84%) patients. The total incidence rate during the outbreak period was 124.5 cases per 100,000 person-years overall and 411.8 cases per 100,000 person-years among children aged <5 years. The outbreak peaked (at 564.4 cases per 100,000 person-years) during the week beginning August 19.

Editorial Note: This large communitywide outbreak occurred in the context of a nationwide increase in the number of cryptosporidiosis nonoutbreak case reports and outbreaks. Contributing factors to this increase might include 1) an actual increase in incidence, 2) improved surveillance, 3) changes in diagnostic testing (e.g., an increase in *Cryptosporidium* testing related to the recent licensing of nitazoxanide, the first-ever drug approved for treating cryptosporidiosis), 4) increased awareness of contaminated recreational water spreading *Cryptosporidium*, or 5) a combination of these factors.

Approximately 80% of patients in this outbreak had exposure to recreational water within 14 days before illness. Although an analytic epidemiologic study was not conducted to identify risk factors associated with the outbreak, four findings suggest initial association with treated recreational water: 1) the high number of patients reporting only exposure to treated recreational water, 2) the lack of child care-only exposures, 3) the wide geographic range of disease precluding an association with drinking water consumption, and 4) the low number of patients with July or August illness onset dates who reported contact with ill persons. As the Utah outbreak evolved, beginning in mid- to late-August, an increasing percentage of patients reported no recreational water exposure but did report contact with persons ill with diarrhea. This suggests that increased secondary transmission occurred later in this outbreak.

Preventing transmission of this chlorine-resistant parasite in pools, water parks, and interactive fountains requires control measures that will limit contamination of the water and decrease swimmers' ingestion of contaminated water. Efforts to educate the public about healthy swimming behaviors (e.g., not swimming while ill with diarrhea and not swallowing the water) are a cornerstone to cryptosporidiosis prevention and control. Environmental control measures include hyperchlorination of treated recreational water venues where patients had swum during their incubation periods or while ill.

Given that the outbreak disproportionately affected children aged <5 years and likely was associated with treated recreational water use, UDOH banned young children from entering public treated recreational water venues, the first known ban in the United States. However, neither the sustainability nor the effectiveness of this intensified control measure can be determined. The ban was implemented at the end of the summer swimming season, so other factors might have contributed to decreased incidence (e.g., closing outdoor pools after Labor Day). The multiple challenges to implementation and enforcement also raise questions about the sustainability of such a ban.

REF: MMWR Weekly, September 12, 2008

California State Residue Monitoring Program Results from 2007

Editorial Note: Also known as - Deja Vu all over again (Yogi Berra) -*For more than 20 years we have been following the pesticide residue monitoring results of the state and federal programs. The results now are very similar to those in the past, although the non-detectable rate has increased due most likely to the increased analytical sensitivity of the methods used. These results show once again, that growers are following pre-harvest guidelines and good agricultural practices.*

In 2007, DPR collected 3,562 samples of more than 100 kinds of commodities. All commodities were derived from plants (no animal products) and were raw (not processed). (Sampling of processed foods is the responsibility of the federal Food and Drug Administration (FDA) and U.S. Department of Agriculture.

Samples were collected throughout the channels of trade, including wholesale and retail outlets, distribution centers, and farmers markets. Both domestic and imported produce were monitored. Of the total samples, 60.8 percent were domestic, 38.7 percent were imported, and 0.5 percent were of undetermined origin.

All samples were tested in analytical laboratories using multiresidue screens capable of detecting more than 200 pesticides and breakdown products. The results:

- 62.6 percent of samples had no pesticide residues detected.
- 36.2 percent of samples had residues that were within the legal tolerance levels.
- 1.2 percent of samples had illegal residues. A produce item with an illegal residue level does not necessarily indicate a health hazard.

Residues within tolerance were found in 36.2 percent of the samples. As in recent years, the majority of these samples had residues at less than 10 percent of the tolerance level. Illegal residues were found in only 1.2 percent of samples. Of these, 0.1 percent had residues that were over the tolerance level, and 1.1 percent had residues of a pesticide not authorized for use on the commodity (no tolerance established). *Please note: Numbers may not add up to 100 percent due to rounding.*

REF: California Department of Pesticide Regulation website

Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses - United States, 2000-2004

Cigarette smoking and exposure to tobacco smoke are associated with premature death from chronic diseases, economic losses to society, and a substantial burden on the United States health-care system. **Smoking is the primary causal factor for at least 30% of all cancer deaths, for nearly 80% of deaths from chronic obstructive pulmonary disease, and for early cardiovascular disease and deaths.** This report presents an updated analysis that indicates that, during 2000-2004, cigarette smoking and exposure to tobacco smoke resulted in at least 443,000 premature deaths, approximately 5.1 million YPLL (years of potential life lost), and $96.8 billion in productivity losses annually in the United States. Comprehensive, national tobacco-control recommendations have been provided.

During 2000-2004, smoking resulted in an estimated annual average of 269,655 deaths among males and 173,940 deaths among females in the United States . The three leading specific causes of smoking-attributable death were lung cancer (128,922), ischemic heart disease (126,005), and chronic obstructive pulmonary disease (COPD) (92,915). Among adults aged ≥35 years, 160,848 (41.0%) smoking-attributable deaths were caused by cancer, 128,497 (32.7%) by cardiovascular diseases, and 103,338 (26.3%) by respiratory diseases (excluding deaths from secondhand smoking and from residential fires). Smoking during pregnancy resulted in an estimated 776 infant deaths annually during 2000-2004. An estimated 49,400 lung cancer and heart disease deaths annually were attributable to exposure to secondhand smoke. The average annual SAM estimates also included 736 deaths from smoking-attributable residential fires.

During 2000-2004, on average, smoking accounted for an estimated 3.1 million YPLL for males and approximately 2.0 million YPLL for females annually, excluding deaths from smoking-attributable residential fires and adult deaths from secondhand smoke. Estimates for average annual smoking-attributable productivity losses were approximately $96.8 billion ($64.2 billion for males and $32.6 billion for females) during this period.

Editorial Note: During 2000-2004, an estimated 443,000 persons in the United States died prematurely each year as a result of smoking or exposure to secondhand smoke. This figure is higher than the average annual estimate of approximately 438,000 deaths during 1997-2001. The number of smoking-attributable deaths varies according to trends in smoking prevalence and the number of deaths from diseases caused by smoking. Although smoking prevalence has declined dramatically since its peak in the 1960s, the number of smoking-attributable deaths has remained relatively unchanged, primarily because of increases in population size (particularly among older age groups). Even with declines in the rates of various smoking-related diseases (e.g., coronary heart disease), the absolute number of deaths is increasing as the total population increases. In addition, cohorts of smokers with the highest peak prevalence have now reached

the ages with the highest incidence of smoking-attributable diseases.

Cigarette smoking continues to impose substantial health and financial costs on society. During 2001-2004, average annual smoking-attributable health-care expenditures were approximately $96 billion. Accounting for direct health-care expenditures and productivity losses (approximately $97 billion), the total economic burden of smoking is approximately $193 billion per year. By comparison, investments in comprehensive, state-based tobacco prevention and control programs in fiscal year 2007 totaled $595 million, approximately 325-times less than the smoking-attributable costs. Comprehensive statewide tobacco-control programs significantly accelerate declines in consumption and smoking prevalence. By increasing their investment in such programs to the levels recommended by CDC, states can further hasten the reduction in cigarette use and reduce the health and economic burden of smoking.

REF: MMWR Weekly, November 14, 2008 / 57(45);1226-1228

Nonfatal, Unintentional, Non-Fire-Related Carbon Monoxide Exposure - United States, 2004-2006

Carbon monoxide (CO) is a colorless, odorless, nonirritating gas that is produced through the incomplete combustion of hydrocarbons. Sources of CO include combustion devices (e.g., boilers and furnaces), motor-vehicle exhaust, generators and other gasoline or diesel-powered engines, gas space heaters, woodstoves, gas stoves, fireplaces, tobacco smoke, and various occupational sources. CO poisoning is a leading cause of unintentional poisoning deaths in the United States; it was responsible for approximately 450 deaths each year during 1999-2004 and an estimated 15,200 emergency department (ED) visits each year during 2001-2003. Health effects of CO exposure can range from viral-like symptoms (e.g., fatigue, dizziness, headache, confusion, and nausea) to more severe conditions (e.g., disorientation, unconsciousness, long-term neurologic disabilities, coma, cardiorespiratory failure, and death). **CO poisoning often is misdiagnosed and underdetected because of the nonspecific nature of symptoms.** To update a previously published report and provide national estimates of CO-related ED visits during 2004-2006, CDC analyzed data from the National Electronic Injury Surveillance System - All Injury Program (NEISS-AIP) database. During 2004-2006, an estimated average of 20,636 ED visits for nonfatal, unintentional, non-fire-related CO exposures occurred each year. **Approximately 73% of these exposures occurred in homes, and 41% occurred during winter months (December-February). Prevention efforts targeting residential and seasonal CO exposures can substantially reduce CO-related morbidity.**

An estimated 61,907 nonfatal, unintentional, non-fire-related cases of CO exposure occurred in the United States during 2004-2006, for an average of 20,636 exposures each year. Of these, 68.5% were classified as CO poisoning, 30.6% as CO exposure, and 0.9% as possible CO exposure. Overall, 7.0 CO-related ED visits per 100,000 population occurred each year during 2004-2006. Children aged <5 years

had the highest estimated rate of CO-related ED visits (11.6 cases per 100,000 population) among all age groups. Among adults, persons aged 25-34 years had the highest estimated rate of CO-related ED visits (10.4 cases per 100,000 population). For older age groups, the estimated rate declined as age increased. Females had a higher estimated rate of CO-related ED visits (7.2 cases per 100,000 population), compared with males (6.7 cases per 100,000 population). The majority (90.4%) of the patients were released from the ED after examination and treatment, but 8.2% were either hospitalized or transferred to other hospitals for specialized care. The highest percentage of CO exposures (41.4%) occurred during the winter months of December (110 per day), January (96 per day), and February (76 per day). The lowest percentage of exposures (16.8%) was observed during the summer. The majority (72.8%) of exposures occurred in homes; approximately 13.4% occurred at workplaces.

Data regarding CO source, detector presence and activation, and toxic effects of CO exposures were missing for >30% of cases. Based on unweighted counts, the primary source of CO exposure was home heating systems (16.4%), which included furnaces, boilers, and unspecified heaters. Motor vehicles were reported as the second most common source of CO exposure (8.1%). CO detectors were reported present and activated in 17.8% of all exposures. More than half (54.1%) of all persons visited the ED with one or more symptoms indicating toxic effects of CO exposure, and 29.4% reported having two or more such symptoms. Headache (27.4%), nausea (14.6%), and dizziness (11.8%) were the most frequently reported symptoms.

Editorial Note: This report provides the most recent estimates of CO-related ED visits in the United States. During 2004-2006, an average of 20,636 ED visits for nonfatal, unintentional, non-fire-related CO exposures occurred each year. These estimates are higher than the estimated average of 15,200 CO-related ED visits per year reported for 2001-2003. Better case ascertainment, increased reporting, or differential in sampling errors might account for this apparent increase; however, the data in this report do not allow drawing of conclusions regarding the cause of the increased visits. During 2004-2006, children aged <5 years had the highest estimated rates of CO-related ED visits and females had higher rates than males. These findings do not correspond to findings on fatal CO exposures, which indicate higher death rates among males and persons aged ≥65 years. Further research is needed regarding why certain population subgroups are at higher risk for CO exposure.

During 2004-2006, approximately 41% of reported cases of CO exposure occurred during the winter. This finding is consistent with previously published data on CO exposure. Increased use of home heating systems during winter, exposure to motor-vehicle exhaust by stranded motorists during blizzards, use of gasoline-powered generators during and after winter storms, and indoor use of charcoal grills, portable stoves, and space heaters all have contributed to the increase in CO exposures during winter. These findings highlight the importance of initiating and evaluating public health awareness campaigns for reducing CO exposures before and during winter months. The majority (72.8%) of patients were exposed in their homes; accordingly, prevention of residential CO exposures could substantially decrease CO-related morbidities.

Harmful exposures to CO, especially those occurring at home, are preventable. Basic preventive measures, including properly installing and maintaining home heating systems, installing CO detectors, and venting cooking and fuel-burning appliances, can minimize exposures. Additional public health messages geared toward at-risk populations might help reduce the number of CO exposures, especially residential and seasonal exposures. Continued surveillance of CO exposure will aid in developing prevention measures

and targeted interventions.

REF: MMWR Weekly, 57(33);896-899.

~~ TOXICOLOGY TIDBITS ~~

Plant Dignity

The new and bizarre wrinkle introduced in Switzerland, which has completely banned the cultivation of any recombinant DNA-modified plants through at least 2010, is a federal regulation that prohibits violations of the 'dignity' of plants. According to a recent analysis by Switzerland's Federal Ethics Committee on Non-Human Biotechnology, recombinant DNA modifications may eventually be permissible, as long as plants' "reproductive ability and adaptive ability are ensured" and they do not "lose their independence." In addition, "social-ethical limits on the genetic modification of plants may exist" meaning, presumably, no modification would be permitted that shortens a plant's life, makes its petals an ugly color or otherwise prevents it from leading a rich and fulfilling existence. (*Nature Biotechnology* 26, 9/10/08).

REF: Chemically Speaking, September 2008

FDA Issues Interim Safety and Risk Assessment of Melamine and Melamine-related Compounds in Food

On October 3, 2008, the U.S. Food and Drug Administration (FDA) issued the results of its interim safety and risk assessment of melamine and melamine-related compounds in food, including infant formula. The purpose of the FDA interim safety/risk assessment was to identify the level of melamine and melamine-related compounds in food which would not raise public health concerns. The interim safety/ risk assessment evaluated the melamine exposure in infant formula and in other foods. To view FDA's interim safety and risk assessment, go to: http://www.fda.gov/bbs/topics/NEWS/2008/NEW01895.html

REF: FDA News, October 3, 2008

FDA Statement on Release of Bisphenol A (BPA) Subcommittee Report

On October 28, 2008, the U.S. Food and Drug Administration (FDA) released a draft safety assessment of the use of BPA in food contact applications. The FDA requested this peer review to provide additional insight into this complex issue.

Consumers should know that, based on all available evidence, the present consensus among regulatory agencies in the United States, Canada, Europe, and Japan is that current levels of exposure to BPA through food packaging do not pose an immediate health risk to the general population, including infants and babies.

For a copy of the Subcommittee Report, go to: http://www.fda.gov/ohrms/dockets/ac/oc08.html#Scienceboard.

REF: FDA News, October 28, 2008

California Department of Public Health Warns Consumers not to Eat Hawthorn Candy

Dr. Mark Horton, director of the California Department of Public Health (CDPH), warned consumers not to eat Hawthorn Candy, which is imported from China, after tests by CDPH found elevated levels of lead. Consumers in possession of Hawthorn Candy should discard it immediately.

Hawthorn Candy is distributed by Next Generation Products Inc, in Rosemead, California. CDPH is currently working with the distributor to ensure that the contaminated candies are removed from the marketplace. Hawthorn Candy comes in a 250 gram package with 70-80 small individually wrapped candies. The individual candies are wrapped in a pink wrapper with green Chinese characters and a picture of the Hawthorn fruit. The front of the outer package includes large green and pink rectangles, black Chinese characters and has a red oval with white Chinese characters. Recent analysis of this candy by CDPH determined that Hawthorn Candy contained as much as 0.20 parts per million (ppm) of lead. California considers candies with lead levels in excess of 0.10 ppm to be contaminated.

Pregnant women and parents of children who may have consumed this candy should consult their physician or health care provider to determine if medical testing is needed.

Consumers who find Hawthorn Candy for sale are encouraged to call the CDPH Complaint Hotline at 1-800-495-3232.

For more information about lead poisoning, consumers are advised to contact their local childhood lead poisoning prevention program or public health department. Additional information and a list of local childhood lead prevention programs is available at http://www.cdph.ca.gov/healthinfo/discond/Pages/CLPPBChildrenAtRisk.aspx

REF: California Department of Public Health, October 3, 2008, 08-53.

Interim Drinking Water Health Advisory For Perchlorate

The U.S. Environmental Protection Agency (EPA) has issued an interim health advisory of 15 ppb to assist state and local officials in addressing local contamination of perchlorate in drinking water. Currently, the EPA is seeking advice from the National Academy of Sciences (NAS) before making a final determination on whether to issue a national regulation for perchlorate in drinking water. States have the right to establish and enforce drinking water standards, and the EPA encourages state-specific situations to be addressed at the local level.

On Oct. 10, 2008, the agency issued a preliminary regulatory determination for public comment in the Federal Register. The notice described the agency's decision that there is a not a "meaningful opportunity for health risk reduction" through a national drinking water regulation for perchlorate. The agency received more than 32,000 comments on the notice.

After considering the comments, as well as recommendations from the EPA advisory groups and offices, the EPA is asking the NAS to provide additional insight on various issues. Specifically, the EPA is asking the NAS to evaluate its derivation of the Health Reference Level of 15 ppb, the use of modeling to evaluate impacts on infants and young children, and the implication of recent biomonitoring studies. The agency is also asking the NAS how it should consider the role of perchlorate relative to other iodide uptake inhibiting compounds and if there are other public health strategies to address this aspect of thyroid health.

REF: IFT Weekly Newsletter, January 14, 2009

Investigation Update: Outbreak of *Salmonella* Typhimurium Infections, 2008–2009

The Centers for Disease Control and Prevention (CDC) is collaborating with public health officials in many states and the United States Food and Drug Administration (FDA) to investigate a multistate outbreak of human infections due to *Salmonella* serotype Typhimurium.

The investigation is ongoing, and exposures to peanut butter and other peanut butter-containing products are being examined. Preliminary analysis of an epidemiologic study conducted by CDC and public health officials in multiple states on January 3 and 4, 2009, comparing foods eaten by ill and well

persons indicates that peanut butter is a likely source of the bacteria causing the infections. To date, no association has been found with major national brand name jars of peanut butter sold in grocery stores. Clusters of infections in several states have been reported in schools and other institutions, such as long-term care facilities and hospitals. King Nut is the only brand of peanut butter used in those facilities for which we have information.

King Nut is produced by Peanut Corporation of America in Blakely, Georgia. This facility, which is no longer producing any products, has expanded its recall to include all peanut butter and peanut paste produced at this plant since July 1, 2008. This product was not sold directly to consumers but was distributed to institutions, food service providers, and companies in 24 states, Canada, Korea, and Haiti. The peanut butter and peanut paste are ingredients in many products, including cookies, crackers, cereal, candy, ice cream and other foods.

The list of peanut butter and peanut paste containing products that may be affected is still being determined and is incomplete at this time. However, the list of currently recalled products can be found on the FDA website. FDA and the product manufacturers are working to determine the list of affected products, which may be extensive. Many companies have already announced whether their products include ingredients being recalled by Peanut Corporation of America, Georgia, and more companies are expected to make similar announcements. The list of recall announcements from companies can be found at FDA website.

Recommendations for Consumers:

- Do not eat products that have been recalled and throw them away in a manner that prevents others from eating them
- Postpone eating other peanut butter containing products (such as cookies, crackers, cereal, candy and ice cream) until more information becomes available about which brands may be affected
- Persons who think they may have become ill from eating peanut butter are advised to consult their health care providers.

REF: CDC website - January 2009

Campylobacter jejuni Infection Associated with Unpasteurized Milk and Cheese - Kansas, 2007

On October 26, 2007, a family health clinic nurse informed the Kansas Department of Health and Environment (KDHE) that *Campylobacter jejuni* had been isolated from two ill persons from different families who were members of a closed community in a rural Kansas county. By October 29, 17 additional members of the community had reported gastrointestinal illness and visited the clinic within a

week. All 19 persons reported consuming fresh cheese on October 20 that was made the same day at a community fair from unpasteurized milk obtained from a local dairy. This report summarizes the findings of an investigation by KDHE and the local health department to determine the source and extent of the outbreak. Eating fresh cheese at the fair was the only exposure associated with illness. Of 101 persons who ate the cheese, 67 (66%) became ill. Although all samples of cheese tested negative for *Campylobacter*, results of the epidemiologic investigation found an association between illness and consumption of fresh cheese made from unpasteurized milk. To minimize the risk for illness associated with milkborne pathogens, unpasteurized milk and milk products should not be consumed.

To read the entire report link to: MMWR Weekly

REF: MMWR Weekly, January 2, 2009 / 57(51);1377-1379.

Neurologic Illness Associated with Occupational Exposure to the Solvent 1-Bromopropane - New Jersey and Pennsylvania, 2007-2008

1-Bromopropane (1-BP) (n-propyl bromide) is a solvent increasingly used as a substitute for ozone-depleting chloro-fluorocarbons and similar regulated compounds. 1-BP is used in vapor and immersion degreasing operations and other manufacturing processes, and as a solvent in industries using aerosol-applied adhesives. In some states, 1-BP is used as a solvent in dry cleaning because of restrictions on use of perchloroethylene (tetrachloroethylene), a possible human carcinogen. Published studies of workers exposed to 1-BP have raised concerns about occupational health risks associated with exposure. This report describes two cases involving workers exposed to 1-BP and diagnosed with clinical manifestations of neurotoxicity. The cases, when coupled with previously reported studies of workers exposed to 1-BP, illustrate potential health risks of 1-BP exposure. Clinicians and public health professionals should be alert to potential health effects among workers exposed to 1-BP, particularly in dry cleaning and other workplaces where 1-BP use might be increasing, and effective control methods to limit exposure to 1-BP should be implemented at worksites.

To read the entire report link to: MMWR Weekly, December 5, 2008

Reduced Hospitalizations for Acute Myocardial Infarction After Implementation of a Smoke-Free Ordinance - City of Pueblo, Colorado, 2002-2006

Exposure to secondhand smoke (SHS) has immediate adverse cardiovascular effects, and prolonged exposure can cause coronary heart disease. Nine studies have reported that laws making indoor workplaces and public places smoke-free were associated with rapid, sizeable reductions in hospitalizations for acute myocardial infarction (AMI). However, most studies examined hospitalizations for 1 year or less after laws were implemented; thus, whether the observed effect was sustained over time was unknown. The Pueblo Heart Study examined the impact of a municipal smoke-free ordinance in the city of Pueblo, Colorado, that took effect on July 1, 2003. The rate of AMI hospitalizations for city residents decreased 27%, from 257 per 100,000 person-years during the 18 months before the ordinance's implementation to 187 during the 18 months after it (the Phase I post-implementation period). This report extends that analysis for an additional 18 months through June 30, 2006 (the Phase II post-implementation period). The rate of AMI hospitalizations among city residents continued to decrease to 152 per 100,000 person-years, a decline of 19% and 41% from the Phase I post-implementation and pre-implementation period, respectively. No significant changes were observed in two comparison areas. These findings suggest that smoke-free policies can result in reductions in AMI hospitalizations that are sustained over a 3-year period and that these policies are important in preventing morbidity and mortality associated with heart disease. This effect likely is mediated through reduced SHS exposure among nonsmokers and reduced smoking, with the former making the larger contribution.

To read the entire report link to: MMWR Weekly, January 2, 2009

Multistate Outbreaks of *Salmonella* Infections Associated with Live Poultry - United States, 2007

During June 2007, the Minnesota Department of Health (MDH) Public Health Laboratory examined specimens from two ill person and identified Salmonella Montevideo isolates. MDH officials interviewed the patients and determined that both had been exposed to chickens.

Editorial Note: Nontyphoidal salmonellosis is an important cause of human illnesses in the United States, resulting in an estimated 1.4 million infections and approximately 400 deaths annually. Poultry are a known reservoir of *Salmonella*, and transmission to humans after contact with live poultry is a well-recognized public health problem. Baby poultry, in particular chicks and ducklings, have been the source of several recent outbreaks of human *Salmonella* infections. This report documents two distinct and unrelated outbreaks of salmonellosis likely caused by exposure to live poultry purchased by mail order or from agricultural feed stores. Several hatcheries, including two implicated in the outbreaks described in this report, hatchery A in Iowa and hatchery B in New Mexico, have been linked to outbreaks repeatedly. The illnesses in the North Dakota siblings highlight the risk for severe disease from *Salmonella* infections, especially in young children.

To read the entire report link to: MMWR Weekly, January 23, 2009.

Children with Elevated Blood Lead Levels Related to Home Renovation, Repair, and Painting Activities - New York State, 2007-2007

Although blood lead levels (BLLs) ≥10 µg/dL are associated with adverse behavioral and developmental outcomes, and environmental and medical interventions are recommended at ≥20 µg/dL, no level is considered safe. A 1997 analysis conducted by the New York State Department of Health (NYSDOH) indicated that home renovation, repair, and painting (RRP) activities were important sources of lead exposure among children with BLLs ≥20 µg/dL in New York state (excluding New York City) during 1993-1994. Subsequently, local health departments in New York state began to routinely collect information about RRP activities when investigating children's home environments for lead sources. This report updates the 1997 analysis with data from environmental investigations conducted during 2006-2007 in New York state (excluding New York City) for 972 children with BLLs ≥20 µg/dL. RRP activities were identified as the probable source of lead exposure in 139 (14%) of the 972 children. Resident owners or tenants performed 66% of the RRP work, which often included sanding and scraping (42%), removal of painted materials or structures (29%), and other activities (29%) that can release particles of lead-based paint. RRP activities continued to be an important source of lead exposure during 2006-2007. Children living in housing built before 1978 (when lead-based paint was banned from residential use) that are undergoing RRP activities should be considered at high risk for elevated BLLs, and appropriate precautions should be taken to prevent exposure.

Editorial Note: In the United States, median BLLs in children aged <5 years have declined 89% from 1976-1980 to 2003-2004. This decline is largely a result of the phase-out of leaded gasoline and efforts by federal, state, and local agencies to limit lead paint hazards in housing. The latter has resulted in a decline in housing units with lead paint hazards from 64 million to 38 million during 1990-2000. The decline in the prevalence of elevated BLLs over time has been most pronounced among children belonging to high-risk groups, especially non-Hispanic black children. However, an estimated 250,000 children remain at risk for exposure to harmful lead levels in the United States. Children living in housing undergoing RRP and built before 1978, when lead-based paint was banned from residential use, and particularly those built before 1950, when concentrations of lead in paint were higher, are now at high risk for elevated BLLs. This is of particular concern in New York state, where both the number (3,309,770) and proportion (43%) of housing units built before 1950 are greater than in any other state.

The assessment described in this report showed that RRP activities were an important source of lead exposure among children with BLLs ≥20 µg/dL during 2006-2007 in New York state. Of 972 children investigated for BLLs ≥20 µg/dL during 2006-2007, 139 (14%) were traceable to RRP. Among the 131 homes linked to RRP-related lead exposures, all but one were built before 1978. Young children in homes built before 1978 are known to be a high-risk group for lead exposure, and these findings indicate RRP activities are an important source of lead exposure in this group.

To read the entire report link to: MMWR Weekly, January 30, 2009

Veterinary Notes

Update: Recall of Dry Dog and Cat Food Products Associated with Human *Salmonella* Schwarzengrund Infections - United States, 2008

On May 16, 2008, CDC reported on a 2006-2007 multistate outbreak of infection with *Salmonella enterica* serotype Schwarzengrund that was associated with dry dog food. At the time of that report, a total of 70 cases had been reported from 19 states, with the last case identified on October 1, 2007. Subsequently, an additional case was identified on December 29, 2007. Epidemiologic and environmental investigations have suggested the source of the outbreak was dry pet food produced by one manufacturer, Mars Petcare US. This report updates the previous CDC report, provides additional epidemiologic findings, and describes additional actions taken by public health agencies and the manufacturer. In 2008, eight more cases have been reported, bringing the total number of cases in the outbreak to 79. On September 12, 2008, the company announced a nationwide voluntary recall of all dry dog and cat food products produced during a 5-month period at one Pennsylvania plant. Dry pet food has a 1-year shelf life. Contaminated products identified in recalls might still be in the homes of purchasers and could cause illness. Persons who have these products should not use them to feed their pets but should discard them or return them to the store.

During 2006-2007, CDC, the Food and Drug Administration (FDA), and multiple state health departments investigated reports to PulseNet of persons infected with a strain of *S. S*chwarzengrund with an indistinguishable pulsed-field gel electrophoresis (PFGE) pattern. A case was defined as a laboratory-confirmed infection with the outbreak strain of *S. S*chwarzengrund in a person residing in the United States who either had symptoms beginning on or after January 1, 2006, or (if the symptom onset date was unknown) had *S. S*chwarzengrund isolated from a specimen on or after January 1, 2006. Investigators initially identified 70 cases, mostly in children. As a result of these findings, on August 21, 2007, Mars Petcare US (referred to as manufacturer A in the May 16, 2008 report) announced voluntary recalls of selected sized bags of two brands of dry dog food, both manufactured by the company at its plant in Everson, Pennsylvania. The recall was based on microbiologic testing by FDA, which found unopened bags of the two brands contaminated with the outbreak strain. Other brands of dry dog and cat food produced at the same facility were not included in that recall. The Everson, Pennsylvania, facility ceased operations during July-November 2007 to enable cleaning, disinfection, and renovation, and resumed normal operations in mid-November 2007.

Despite the 2007 recall, the outbreak strain of *S.S*chwarzen-grund was isolated from eight more ill

persons during January-October 2008, bringing the total number of cases to 79 in 21 states. The ill persons were residents of Pennsylvania (three), Georgia (two), New York (two), and Texas (one). The last reported specimen collection date was September 18, 2008. The only connection between the ill persons was infection with the outbreak strain; they shared no household or family contacts.

Among the eight ill persons, five were female. Among the seven whose age was available, the median age was 8 months (range: 4 months-39 years); six persons were aged ≤2 years. Of five ill persons for whom clinical information was available, all five had visited a health-care professional, two had bloody diarrhea (no information on symptoms was available for the other three), and one had been hospitalized. No deaths were reported. Of six households with pet ownership known, all six had pets (i.e., dogs, cats, or both), but no illness was reported in any pet. Pets in three households were being fed a brand of dry pet food known to be produced at the Everson plant. On October 1, the company announced that the Everson plant would be closed permanently. The FDA investigation is continuing.

Editorial Note: This outbreak of human *Salmonella* Schwarzengrund infections has continued over a 3-year period, likely because of continued contamination in the Everson, Pennsylvania, pet food production facility. *S. S*chwarzengrund is a rare serotype of *Salmonella*. Although the outbreak PFGE pattern is the most common *S. S*chwarzengrund PFGE pattern in the PulseNet database, isolates with that pattern made up only 20 (4%) of the 498 *S. S*chwarzengrund isolates from humans submitted to PulseNet during 1999-2005, suggesting that the illnesses described in this report resulted from a common source.

Considering the wide distribution of these products and the relatively small number of cases, the attack rate for this outbreak appears to be low. However, only an estimated 3% of all *Salmonella* infections in the United States are laboratory confirmed and reported to surveillance system. A low attack rate supports the hypothesis that infection might have resulted from practices in a limited number of households that brought humans into contact with the contaminated pet food and led to amplification of the organisms (e. g., cross-contamination in the kitchens or irregular cleaning of pet food bowls that might promote bacteria growth). In addition, the strain might primarily affect persons (e.g., young children) who are more susceptible to lower infective doses.

This outbreak is the first documented outbreak to associate human *Salmonella* infections with contaminated dry dog food and to trace human illness to a contaminated pet food plant. The original source of contamination and mechanisms for continued contamination in the Everson plant over a 3-year period are unknown. The absence of cases during January-March 2008 suggests that cleaning and disinfection of the plant might have had some effect. FDA is working with Mars Petcare US to better understand this problem.

Since 2006, at least 13 recall announcements involving 135 pet products (e.g., dry dog food and cat food, pet treats, raw diets, and pet supplements) have been issued because of *Salmonella* contamination. These recalls have resulted from contamination with multiple serotypes of *Salmonella* and have been associated with multiple pet food manufacturing plants in the United States. Pet products typically are recalled after product testing indicates contamination with *Salmonella*. To date, no human illness has been associated with these other pet food recalls.

Although the last reported case in this outbreak was tested on September 18, 2008, additional cases might occur. The September 2008 recall involved approximately 23,109 tons of dry pet foods, representing 105

brands. However, dry pet food has a 1-year shelf life, and contaminated product might still be in the homes of purchasers and could produce illness.

State and local health departments that identify ill persons with the outbreak strain should query ill persons or their caregivers to find out about pet-related exposures, including brands of dry pet food used in the home. When possible, pet stool specimens and samples of dry pet food should be collected and submitted for laboratory testing. Hypothesis-generating interviews for enteric infections should routinely include questions on contact with pets and other animals, pet food, pet treats, and pet supplements.

Consumers and health departments should be aware that all dry pet food, pet treats, and pet supplements might be contaminated with pathogens such as *Salmonella*, and consumers should use precautions with all brands of dry pet food, treats, and supplements. In contrast, canned pet food is unlikely to be contaminated with such pathogens because the manufacturing process should eliminate bacterial contamination. To prevent *Salmonella* infections, persons should wash their hands for at least 20 seconds with warm water and soap immediately after handling dry pet foods, pet treats, and pet supplements, and especially before preparing and eating food for humans. Infants should be kept away from pet feeding areas. Children aged <5 years should not be allowed to touch or eat dry pet food, treats, or supplements.

In addition to transmission of *Salmonella* from contact with dry pet food, humans can acquire *Salmonella* infection from contact with the feces of animals that acquired *Salmonella* infection from contaminated dry pet food or other sources. Effective hand washing after handling pets and animal feces will prevent such infections. Persons who suspect that contact with dry pet food or pets has caused illness should consult their health-care providers. Additional information on the transmission of *Salmonella* from pets to humans is available at http://www.cdc.gov/healthypets/diseases/salmonellosis.htm.

REF: MMWR Weekly, November 7, 2008

Click on the Pig!