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~ Dr. Arthur L. Cragmill ~
Extension Toxicologist

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Measuring Exposure to an Elemental Mercury Spill Dakota County, Minnesota, 2004

Elemental mercury spills can cause contamination of neighborhoods and homes and result in neurologic and kidney disorders in exposed persons who inhale mercury vapors. Often, however, difficulties exist in determining the magnitude of exposure and effectiveness of decontamination or in recognizing that reexposure has occurred. [This report](#) summarizes the response to an elemental mercury exposure that resulted in the decontamination of 48 persons and the subsequent analysis of blood and urine samples from 14 exposed youths aged 6-16 years. Demolition and waste-disposal firms and government agencies must take actions to ensure that elemental mercury is adequately secured before disposal.

Case Report

In preparation for demolition of a factory in Dakota County, Minnesota, hazardous waste from the factory was temporarily stored in a shed, which was not effectively secured. During a late afternoon in September 2004, two teenagers entered the shed and found two canning jars containing approximately **21 pounds of elemental mercury**. The teenagers brought the mercury back to their neighborhood, where they and approximately 12 other youths played with it, throwing handfuls of mercury at each other and splashing in a large puddle of mercury on an outdoor basketball court. This initial exposure was limited to <2 hours because of rapid response by a parent who saw what the youths were doing, told them to go home and shower, and contacted the police. Subsequently, 48 persons, including 18 youths, were decontaminated with water and detergent and homes were scanned for contamination by using a real-time mercury vapor analyzer. On the recommendation of Minnesota Department of Health (MDH) staff, residents of 12 contaminated homes were sheltered in a motel by the American Red Cross.

As part of its epidemiologic investigation, MDH staff interviewed some of the youths the morning after the event and learned that the teenagers had attempted to ignite the mercury and might have been exposed to fumes. Subsequent sampling with the mercury vapor analyzer in motel rooms of displaced families revealed mercury contamination, and high concentrations of mercury vapor found near the hair of three youths 24 hours after exposure suggested that exposures might have been more severe than initially indicated, that decontamination was incomplete, and that exposures were continuing. Consequently, 14 youths aged 6-16 years with known exposures were examined by physicians; 11 were evaluated at a hospital in St. Paul, Minnesota.

Editorial Note: Exposure to elemental mercury occurs largely from inhaling mercury vapors; very little mercury is absorbed through the skin or by ingestion. Mercury spills pose a serious health hazard and are difficult to clean because most common methods (e.g., sweeping or vacuuming) disperse mercury, increasing the surface area of the mercury, increasing evaporation, and exacerbating the contamination. This report illustrates that use of real-time portable instruments such as mercury vapor analyzers can enable investigators to rapidly measure mercury vapor concentrations and determine the extent of an exposure incident.

The half-life of total mercury in blood for persons exposed to mercury vapor is 2-5 days, reflecting distribution to tissues and elimination through exhalation, which corresponds to the results in this report; blood mercury levels were below the detection limit 7-13 days after initial positive measurement. Exhaled mercury concentrations have been found to decrease, with half-lives of 13-25 hours and 1.6-2.3 days. These half-lives also are consistent with the results in this report. However, exhalation half-lives longer than 30 hours might indicate continuing exposure or reexposure to mercury. The patient with the calculated half-life of 44 hours had been reexposed on day 4. Exhaled vapor concentrations can also depend on proper exhalation by patients. To compare data between patients, investigators should instruct all patients to exhale in the same manner; however, mercury vapor half-lives are repeated measures and will not be as sensitive to individual differences. The lack of correlation between exhaled mercury and blood mercury is likely caused by measurement of different forms of mercury (i.e., total mercury for blood and mercury vapor for exhaled) and the small range of exposures.

Approximately 70%-80% of inhaled mercury enters the blood before distribution to tissues; the rest is immediately

exhaled. An estimated 7% of retained mercury is exhaled in the first 3 days after exposure. Approximately 9.2% and 2.4% is excreted in feces and urine, respectively, within 7 days. Conversely, mercury concentrations in blood can increase rapidly after an acute exposure to mercury, providing timely indication of exposure. In addition, the short half-life of mercury in blood can enable confirmation of the cessation of exposure. However, investigators should be aware of potential confounders to measurements of mercury concentrations (e.g., fish consumption, dental amalgams, medicinal use, and ritualistic use of mercury such as sprinkling on a floor for good luck).

In this report, the experiences of responders and investigators also underscore several recommendations for demolition and waste-disposal companies and government agencies. These include 1) securing elemental mercury at demolition sites, 2) confirming mercury decontamination by sampling, 3) providing sensitive field instruments and appropriate training for tracking mercury contamination and exposure, and 4) incorporating quality-assurance controls into all data collection activities.

REF: MMWR, February 18, 2005, 54(06).



Outbreaks of *Salmonella* Infections Associated with Eating Roma Tomatoes United States and Canada, 2004

Three outbreaks of *Salmonella* infections associated with eating Roma tomatoes were detected in the United States and Canada in the summer of 2004. In one multistate U.S. outbreak during June 25-July 18, multiple *Salmonella* serotypes were isolated, and cases were associated with exposure to Roma tomatoes from multiple locations of a chain delicatessen. Each of the other two outbreaks was characterized by a single *Salmonella* serotype: Braenderup in one multistate outbreak and Javiana in an outbreak in Canada. In the three outbreaks, 561 outbreak-related illnesses from 18 states and one province in Canada were identified. [This report](#) describes the subsequent investigations by public health and food safety agencies. Although a single tomato-packing house in Florida was common to all three outbreaks, other growers or packers also might have supplied contaminated Roma tomatoes that resulted in some of the illnesses. Environmental investigations are continuing. Because current knowledge of mechanisms of tomato contamination and methods of eradication of *Salmonella* in fruit is inadequate to ensure produce safety, further research should be a priority for the agricultural industry, food safety agencies, and the public health community.

Editorial Note: This report describes three outbreaks in the United States and Canada in which Roma tomatoes were implicated; as a result of these outbreaks, 2004 had the highest number of recorded annual tomato-associated *Salmonella* infections.

Salmonella can enter tomato plants through roots or flowers and can enter the tomato fruit through small cracks in the skin, the stem scar, or the plant itself. However, **whether *Salmonella* can travel from roots to the fruit, or if seeds can contaminate subsequent generations of tomato plants, is unknown.** Understanding the mechanism of contamination and amplification of contamination of large volumes of tomatoes is critical to prevent large-scale, tomato-associated outbreaks. Contamination might occur during multiple steps from the tomato seed nursery to the final kitchen. Eradication of *Salmonella* from the interior of the tomato is difficult without cooking, even if treated with highly concentrated chlorine solution.

Public health professionals should be aware of tomatoes as a possible vehicle when investigating *Salmonella* outbreaks. Current knowledge of mechanisms of tomato contamination and methods of eradication of *Salmonella* in fruit are inadequate to fully define interventions that will ensure produce safety. Studies into these concerns should be a priority for the agricultural industry, food safety agencies, and the public health community.

REF: MMWR, April 8, 2005, Volume 54, No. 13



EPA to Strengthen Protection from Lead in Drinking Water

EPA is initiating the Drinking Water Lead Reduction Plan to strengthen, update and clarify existing requirements for water utilities and states to test for and reduce lead in drinking water. This action, which follows extensive analysis and assessment of current implementation of these regulations, will tighten monitoring, treatment, lead service line management and customer awareness. The plan also addresses lead in tap water in schools and child care facilities to further protect vulnerable populations. Lead is a highly toxic metal that was used for many years in products found in and around homes. Even at low levels, lead may cause a range of health effects including behavioral problems and learning disabilities. **Children six years old and under are most at risk because this is when the brain is developing. The primary source of lead exposure for most children is lead-based paint in older homes.** Lead in drinking water adds to that exposure.

Drinking water does not start out containing lead. Lead is picked up as water passes through pipes and household plumbing fittings and fixtures that contain lead. Water leaches lead from these sources and becomes contaminated. In 1991, to reduce lead in drinking water, EPA issued the LCR. The LCR requires water utilities to reduce lead contamination by controlling the corrosiveness of water and, as needed, replace lead service lines used to carry water from the street to the home. Under the LCR, if 10 percent of required sampling show lead levels above a 15 parts per billion (ppb) action level, the utility must 1) take a number of actions to control corrosion and 2) carry out public education to inform consumers of actions they can take to reduce their exposure to lead. If lead levels continue to be elevated after anti-corrosion treatment is installed, the utility must replace lead service lines.

Because virtually all lead enters water after it leaves the main system to enter individual homes and buildings, the LCR is the only drinking water regulation that requires utilities to test water at the tap. This also means that individual homes will have different levels of lead in their tap water due to the age or condition of pipes, plumbing materials and fixtures or other factors. For this reason, customer awareness and education are important components of the LCR and state and water utilities lead reduction programs.

EPA plans to propose regulatory changes to the LCR in the following areas by early 2006:

- **Monitoring:** To ensure that water samples reflect the effectiveness of lead controls, to clarify the timing of sample collection and to tighten criteria for reducing the frequency of monitoring.
- **Treatment Processes:** To require that utilities notify states prior to changes in treatment so that states can

provide direction or require additional monitoring. EPA will also revise existing guidance to help utilities maintain corrosion control while making treatment changes.

- **Customer Awareness:** To require that water utilities notify occupants of the results of any testing that occurs within a home or facility. EPA will also seek changes to allow states and utilities to provide customers with utility-specific advice on tap flushing to reduce lead levels.
- **Lead Service Line Management:** To ensure that service lines that test below the action level are re-evaluated after any major changes to treatment which could affect corrosion control.
- **Lead in Schools:** The agency will update and expand 1994 guidance on testing for lead in school drinking water. EPA will emphasize partnerships with other federal agencies, utilities and schools to protect children from lead in drinking water.

In addition, the agency will convene a workshop in mid-2005 to discuss actions that can be taken to reduce the lead content of plumbing fittings and fixtures. EPA will also promote research in key areas, such as alternative approaches to tap monitoring and techniques for lead service line replacement.

More information on National Review of LCR Implementation and Drinking Water Lead Reduction Plan is available online at: http://www.epa.gov/safewater/lcrmr/lead_review.html. Information about lead in drinking water is available online at: <http://www.epa.gov/safewater/lead> or by calling the Safe Drinking Water Hotline at 1-800-426-4791. Information about lead around the home is available online at: <http://www.epa.gov/lead> or from EPA's National Lead Information Center (NLIC) at 1-800-424-LEAD (5323).

REF: [EPA News Release](#), March 7, 2005.



EPA Establishes Carcinogen Guidance

EPA has issued guidelines for carcinogen risk assessment. EPA over time has changed its position on how to list chemicals that are/maybe carcinogenic. The Cancer Guidelines recommend that the descriptor not be separated from the narrative which fully characterizes the weight of the evidence. The groupings are as follows.

- **Carcinogenic to Humans:** The Guidelines recommend this descriptor when there is convincing epidemiologic evidence demonstrating causality between human exposure and cancer, or exceptionally when there is strong epidemiological evidence, extensive animal evidence, knowledge of the mode of action, and information that the mode of action is anticipated to occur in humans and progress to tumors.
- **Likely to be Carcinogenic to Humans:** The Guidelines recommend this descriptor when the available tumor effects and other key data are adequate to demonstrate carcinogenic potential to humans, but does not reach the weight-of-evidence for the descriptor "carcinogenic to humans."
- **Suggestive Evidence of Carcinogenic Potential:** The Guidelines recommend this descriptor when the evidence from human or animal data is suggestive of carcinogenicity, which raises a concern for carcinogenic effects but is judged not sufficient for a stronger conclusion.
- **Inadequate Information to Assess Carcinogenic Potential:** The Guidelines recommend this descriptor when available data are judged inadequate to perform an assessment.

- **Not Likely to be Carcinogenic to Humans:** The Guidelines recommend this descriptor when the available data are considered robust for deciding that there is no basis for human hazard concern. (Federal Register, April 7, 2005)

REF: Pesticide Reports (Oklahoma State University) May 2005.



Herbal Medicine Products May Contain Heavy Metals

Twenty percent of Ayurvedic herbal medicine products (HMPs) available in Boston-area grocery stores contained potentially harmful levels of heavy metals, according to an analysis of 70 products. Ayurvedic medicine originated in India more than 2,000 years ago, and relies on HMPs. Ayurveda has been increasing in popularity in the U.S. and remedies are available from South Asian markets, Ayurveda practitioners, health food stores, and the Internet.

Since 1978, at least 55 cases of heavy metal intoxication associated with Ayurvedic HMPs have been reported in adults and children in the U.S. and abroad.

In this study, (*JAMA* 292(23):2868-2873, Dec 15, 2004) researchers bought 70 different HMPs at 30 Boston-area stores, and sent them to the New England Regional Environmental Protection Agency laboratory for analysis. The HMPs were manufactured by 27 companies in India and Pakistan, and cost an average of \$2.99 per package. The products had a variety of indications, most commonly gastrointestinal (71%). Seven specifically recommended pediatric use.

Results of product analyses showed that 14 (20%) contained lead, mercury, and/or arsenic. Those who took the products as recommended could be at risk for heavy metal intake above U.S. Pharmacopoeia standards.

The authors recommended mandatory testing of all imported Ayurvedic HMPs for toxic levels of heavy metals as well as advisories to users, encouraging them to consult their physicians about heavy metal screening. In addition, physicians should consider Ayurvedic HMP intake in the differential diagnosis of unexplained heavy metal toxicity.

REF: Nutrition Perspectives, 30(2), 2005.



USDA Pesticide Data Program Releases 2003 Data

The USDA's Pesticide Data Program (PDP) has released data for samples collected in the calendar year 2003 and is the 13th annual summary. The PDP collects food samples (both nationally grown and imported) from around the U.S. and analyzes them for pesticide residues. This publication, the PDP database file for 2003, and annual summaries and database files for previous years are available on the Internet at www.ams.usda.gov/science/pdp.

Executive Summary

In 2003, sampling and testing program operations were carried out with the support of 10 states: California, Colorado, Florida, Maryland, Michigan, New York, Ohio, Texas, Washington, and Wisconsin. PDP tested fresh and processed fruit and vegetables, barley, wheat flour, butter, and drinking water for various insecticides, herbicides, fungicides, and growth regulators. In late 2002, EPA identified the triazole-derivative class of fungicides and their metabolites as a critical data need. PDP immediately responded by developing specialized methods of analysis for apples, peaches (fresh and canned), and wheat flour. These commodities were introduced for triazole and metabolite analyses in January 2003. Canned peaches and wheat flour were also analyzed using multi-residue methods for a number of additional pesticide residues.

Of the 12,316 total samples collected and analyzed, 9,732 were fruit and vegetable commodities including asparagus (fresh and canned), cantaloupe, corn (frozen, sweet), cucumbers, green beans (canned), mushrooms, onions, peaches (canned), pears, pear juice (concentrate and puree), peas (frozen, sweet), spinach, sweet bell peppers, sweet potatoes, and tomatoes; and apples and fresh peaches, which were analyzed only for triazoles. PDP also tested 452 barley, 606 wheat flour, 732 butter, and 794 drinking water samples.

Excluding drinking water, approximately 87 percent of all samples were domestic and 12 percent were imported. One percent was of unknown origin. Asparagus, cantaloupe, cucumbers, sweet bell peppers, and tomatoes accounted for most of the imported commodities.

Of the samples tested by multiresidue methods, 43 percent of the fruit and vegetable samples, 8 percent of barley samples, 45 percent of wheat flour samples, and 99 percent of the butter samples had detectable residues. Residues detected in wheat flour resulted primarily from low level detections of the triazole alanine and triazole acetic acid metabolites. Residue findings in butter were primarily low level residues of endosulfan sulfate and the environmental contaminants dieldrin and DDE p,p'.

Overall, approximately **54 percent of all samples tested by multiresidue methods contained no detectable pesticides** (parent compound and metabolite(s) is combined), 22 percent contained one pesticide, and 24 percent contained more than one pesticide. Generally, fewer pesticides were found in processed products and grains than in fresh commodities. Low levels of environmental contaminants were detected in cantaloupe, cucumbers, spinach, and butter at concentrations below levels that trigger regulatory actions.

In **finished drinking water**, PDP detected low levels (measured in parts per trillion) of some pesticides, primarily widely used herbicides. **None of the detections exceeded established EPA Maximum Contaminant Levels or Health Advisory levels.**

PDP testing found residues exceeding an established tolerance in 0.3 percent of the 11,522 samples (excluding drinking water). A tolerance is the maximum amount of a pesticide residue allowable on a raw agricultural commodity. Established tolerances are listed in the Code of Federal Regulations, Title 40, Part 180. Residues with no established tolerance were found in 1.5 percent of all samples (excluding drinking water). These residues were detected **at very low concentrations** and may be the result of spray drift, crop rotations, or the use of sanitizers in food handling establishments. PDP communicates these findings to FDA when they are reported by testing laboratories.

This 2003 PDP Summary is available on the PDP Web site at <http://www.ams.usda.gov/science/pdp>.

REF: Agricultural Marketing Service News Release, March 1, 2005



Human Exposure to Mosquito-Control Pesticides Mississippi, North Carolina, and Virginia, 2002 and 2003

Public health officials weigh the risk for mosquito-borne diseases against the risk for human exposure to pesticides sprayed to control mosquitoes. Response to outbreaks of mosquito-borne diseases has focused on vector control through habitat reduction and application of pesticides that kill mosquito larvae. However, in certain situations, public health officials control adult mosquito populations by spraying ultra-low volume (ULV) (<3 fluid ounces per acre [oz/acre]) mosquito-control (MC) pesticides, such as naled, permethrin, and d-phenothrin. These ULV applications generate aerosols of fine droplets of pesticides that stay aloft and kill mosquitoes on contact while minimizing the risk for exposure to persons, wildlife, and the environment. [This report](#) summarizes the results of studies in Mississippi, North Carolina, and Virginia that assessed human exposure to ULV naled, permethrin, and d-phenothrin used in emergency, large-scale MC activities. The findings indicated ULV application in MC activities **did not result in substantial pesticide exposure to humans**; however, public health interventions should focus on the reduction of home and workplace exposure to pesticides.

Editorial Note: Although ULV applications of naled and synthetic pyrethroids have a low toxicity to humans, occupational studies suggest that excessive exposure to these pesticides can cause serious health effects. Prolonged exposure to high concentrations of naled and synthetic pyrethroids can cause dermatitis, reactive airway disease, gastrointestinal distress, central nervous system depression, paralysis, and death. Exposure often results from use of these pesticides in food production, treatment of wool, wood products, and pest-control efforts; however, few studies have quantitated the level of human exposure to MC pesticides in nonoccupational settings.

The studies described in this report represent the first efforts to quantitate human exposure to MC pesticides during large-scale MC activities. Two of these studies used a prospective crossover design that compared urine metabolite concentrations after ULV spraying of pesticides with baseline concentrations. Use of sensitive analytic methods in these studies indicated that the urine pesticide metabolite concentrations measured were low (parts per billion). The concentration of urine metabolites in these studies are comparable with those measured in the general population. In addition, these three studies did not indicate an overall increase of pesticide metabolite concentrations in the urine of participants after spraying during MC activities. The concentrations of naled, permethrin, and d-phenothrin during emergency ULV applications might be too low to cause important human exposure.

In certain participants, investigators found an association between home and/or work application of pesticides and pesticide metabolite concentrations. The concentrations in participants who had histories of exposure were within the range of the general U.S. population. These findings are consistent with occupational studies in which prolonged exposure to pesticides through several hours of work in plant nurseries and greenhouses was associated with low but measurable concentrations of urine pesticide metabolites. These findings also are compatible with a prospective study that quantitated higher 3-phenoxybenzoic acid concentrations in the urine of pest-control operators 1 day after spraying pyrethroids.

Aerial spraying with ULV naled and truck-mounted spraying with permethrin/d-phenothrin were not associated with an increase in urine pesticide metabolite concentrations among residents of these rural, suburban, and urban communities. *These findings suggest that ULV application of naled, permethrin, and d-phenothrin is safe to humans as part of integrated vector control. The findings are noteworthy because ULV applications of pesticides that kill adult mosquitoes are an important tool in the public health response to WNV.* Future studies should address the long-term safety of low-concentration exposure to naled and synthetic pyrethroid applications. In addition, public health

interventions might be needed to reduce home and workplace exposure to pesticides.

REF: MMWR, 54(21), June 3, 2005.



Unintentional Topical Lindane Ingestions - United States, 1998-2003

Lindane is an organochlorine pesticide found in certain prescription-only shampoos and topical lotions used to treat pediculosis (i.e., lice infestation) and scabies; lindane has been associated with human neurologic toxicity. In 2004, CDC was alerted to cases of illness caused by unintentional ingestion of lindane by persons mistaking the product for a liquid oral medication (e.g., cough syrup). To assess the extent of illness from ingestion of lindane, CDC, with assistance from the U.S. Environmental Protection Agency, Food and Drug Administration (FDA), and state health departments, collected case reports and analyzed data from the Sentinel Event Notification System for Occupational Risks-Pesticides (SENSOR-Pesticides) program and the Toxic Exposure Surveillance System (TESS). [This report](#) summarizes the results of that analysis, which identified 870 cases of unintentional lindane ingestion during 1998-2003, and describes two examples of lindane ingestions. To reduce the risk of lindane ingestion, public health authorities should alert clinicians to the hazards of lindane and the importance of following FDA usage guidelines, which include dispensing lindane in manufacturer-produced, 1- or 2-ounce single-use containers.

Case Reports

Case 1. In November 2004, the Washington State Department of Health reported that a boy aged 3 years ingested approximately 1 teaspoon of 1% lindane shampoo from a previously used 2-ounce bottle. Subsequently, the mother induced vomiting in the boy twice; 1 hour later the boy collapsed and experienced a tonic-clonic seizure lasting 4-5 minutes. After 3 hours, the child was discharged from the emergency department in stable condition.

Case 2. In December 2003, a man aged 47 years in Texas mistakenly ingested 1 ounce of lindane (percentage concentration unknown) from a bottle he believed to be cough syrup. The man vomited; he contacted the poison control center the following morning. He did not seek clinical evaluation.

Editorial Note: Pediculosis and scabies are common human parasitic infestations. This report indicates that when lindane, a treatment for pediculosis and scabies, is unintentionally ingested, illness can occur, including vomiting and seizures. In 1995, lindane was changed to a second-line therapy for pediculosis because safer alternatives existed. In 2003, in light of continued postmarketing surveillance reports of toxicity, FDA revised product labeling guidelines to limit the amount of lindane dispensed to 1- or 2-ounce single-use containers and to require providing patients with a Medication Guide warning of risks from inappropriate use. In addition, FDA issued a Public Health Advisory with these changes. The new advisory, along with a substantial increase in retail price for lindane, appear to have resulted in a declining number of cases of lindane ingestion. This decline is similar to the 67% decrease in lindane prescriptions from 1998 to 2003.

Before the advisory, bottles of bulk lindane were sometimes repackaged by pharmacies into smaller bottles resembling those used for liquid oral medications (e.g., cough syrup). This resemblance likely contributed to many unintentional ingestions. Subsequent to the advisory, bottles of bulk lindane still in use were not recalled from pharmacies. Therefore, some repackaging might still occur. In addition, consumers might have repackaged lindane in their homes.

In September 2004, the North American Task Force on Lindane drafted an action plan for future use. On January 1, 2005, Canada withdrew registration of lindane for agricultural pest control; Mexico is working on a plan to phase out all uses of lindane. However, with the exception of California, which banned lindane for medicinal use on January 1, 2002, U.S. representatives to the North American Commission for Environmental Cooperation announced that the United States will continue to allow use of lindane as both a pesticide and pharmaceutical.

REF: MMWR, 54(21), June 3, 2005.



Reduce Risks of Using Manure as a Garden Fertilizer

Vegetable gardeners add fertilizers to gardens to improve the soil and add nutrients for an extra growing boost. However, there are potential food safety risks if you plan to use manure as a fertilizer on your vegetable garden.

Some bacteria that are associated with foodborne illnesses can be found in fresh manure because these bacteria are a natural part of animal intestinal tracts. Vegetables can be contaminated if they are grown in soil where manure has been applied or where soil splashes onto vegetables due to rain or irrigation.

The USDA National Organic Program is concerned about vegetable growers using manure as a fertilizer, and recommends that manure be applied at least 120 days before harvesting vegetables. For most gardeners in Minnesota, this recommendation does not work because the time between fertilizing and harvesting is shorter than 120 days!

To reduce risks of contaminating vegetables when using manure, consider these options:

- Move your vegetable garden to a location that is not affected by surface runoff from manure storage or from crop land spread with manure.
- Avoid contaminating your vegetable garden from wind-borne drift during manure spreading.
- Use sterilized manure, which is available from gardening stores.
- If you plan to apply manure to your garden this year, use properly composted manure.
- Apply non-composted or fresh manure only in the fall of the preceding harvest year. Minnesota's winter weather will destroy pathogens that may be present in fresh manure.
- If you apply non-composted or fresh manure in the spring, make sure there are 4-6 months of time between fertilizing and harvesting or on soil used in growing late-season vegetables.

All produce grown in a manure-fertilized garden should be thoroughly washed in clean cold water and peeled (if possible) to reduce the risk of contamination. Cooking vegetables also reduces or eliminates the contamination risk.

Tips for washing fresh produce include:

- Wash produce just before serving, not before storing. Washing causes produce to spoil faster.
- Scrub produce that has a firm skin or hard rind, such as carrots, potatoes, melons or squash, with a vegetable brush and cool running water.
- Always wash squash and melons, even if you never eat the rind or skin. When cut, dirt or bacteria that are on the outer surface can be transferred to the inner flesh.

- Throw away outer leaves of leafy vegetables (lettuce and cabbage) before washing.
- Do not wash fresh produce with detergent or bleach solutions. Fruits and vegetables are porous and can absorb the detergent or bleach, which is not intended for use on food. Consuming them has the potential to make you sick.

To enjoy your home-grown produce and reduce contamination risks from using manure as a fertilizer, use a common sense approach and wash the produce before eating.

REF: University of Minnesota Extension Service News, May 24, 2005



◆ TOXICOLOGY TIDBITS ◆

Tuberculosis Cases Prompt Advisory About Soft Cheese Made From Raw Milk

The Food and Drug Administration (FDA) is advising that some soft cheeses made with raw milk present a health risk, especially to high risk groups, such as pregnant women, newborns, older adults, and people with weakened immune systems. Such raw milk soft cheeses can cause several serious infectious diseases including listeriosis, brucellosis, salmonellosis and tuberculosis. Recently, cases of tuberculosis in New York City have been linked to consumption of queso fresco style cheeses, either imported from Mexico or consumed in Mexico, contaminated with *Mycobacterium bovis*, the causative agent.

The raw milk soft cheeses of most concern can originate from Mexico and Central American countries. Queso fresco style cheese, which is soft and white, has been found to be the most popular kind of cheese among the Hispanic community and can include Queso Panela, Asadero, Blanco and Ranchero, among other styles and may be imported or produced in the U.S.

FDA recommends that consumers do not eat any unripened raw milk soft cheeses from Mexico, Nicaragua, or Honduras. Data show that they are often contaminated with pathogens. FDA further recommends that consumers not purchase or consume raw milk soft cheeses from sources such as flea markets, sellers operating door-to-door or out of their trucks or shipped or carried in luggage to them from Mexico, Nicaragua, or Honduras. This includes cheeses made at home by individuals.

FDA further advises that there is some risk of infection from a number of pathogenic bacteria for anyone who eats raw milk soft cheese from any source.

Clarification: On March 14th, FDA issued a raw milk soft cheese advisory that mentioned a number of cheeses, including "Ranchero." We've become aware that "Ranchero" is a trademark of the Cacique company, in Industry, California. Cacique's "Ranchero" is made with pasteurized milk. The milk cheese advisory was not intended to include this specific product.



West Nile Virus Detected in 19 California Counties

Heavy rains and warm temperatures have led to the early arrival of mosquitoes and West Nile virus (WNV) in California, State Public Health Officer Dr. Richard J. Jackson announced today. To date, WNV has been detected in 19 of California's 58 counties. No human cases have yet been reported in 2005.

"This is a critical time for mosquito prevention," Jackson said. "Residents should eliminate standing water around their homes where mosquitoes might breed, keep their pools in good working order and report dead birds."

As of March 17th, 32 dead birds from the following counties have tested positive for WNV: Alameda, Contra Costa, El Dorado, Fresno, Humboldt, Kern, Kings, Los Angeles, Orange, Placer, Sacramento, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus, Tulare and Yolo counties. WNV has also been detected in a sentinel chicken in San Bernardino County and mosquitoes in Orange County.

The public can report dead birds to the California Department of Health Services by logging on to www.westnile.ca.gov or phoning toll-free 1-877-WNV-BIRD.

"Early detection is the key to preventing the spread of West Nile virus," Jackson said. "We anticipate that there will be an increase in West Nile virus activity in Northern and Central California this year. "

Jackson also urged all horse owners to consult their veterinarians about proper and timely WNV vaccinations for their animals. In 2004, 540 equine WNV infections were reported statewide, most of which involved horses that were not vaccinated.

"Although California experienced widespread West Nile virus transmission last year, we believe that the number of human cases would have been greater without the aggressive control measures conducted by state and local agencies," Jackson said. "Personal protection measures taken by the public last year were significant in minimizing illness and death from West Nile virus. I urge all residents to be vigilant in avoiding mosquito bites."

Last year, there were a total of 829 human WNV infections, including 27 deaths, reported from 23 counties in California. The virus was detected in all 58 counties.

For more information about WNV or to report dead birds, visit www.westnile.ca.gov.

REF: <http://www.dhs.ca.gov/>



OPP Annual Report for 2004 is Now Available

EPA's Pesticide Program is pleased to make available online its 2004 annual report, entitled [Taking Care of Business: Protecting Human Health and the Environment](#). The report highlights the accomplishments and key achievements in 2004. There are sections on registration, reregistration and tolerance reassessment, international harmonization, E-government, endangered species, biotechnology, partnerships, and other key areas as well.

REF: US EPA Press Release, March 2005



Everything You Ever Wanted to Know About Eggs

Once you have the eggs in the kitchen; Cleaning eggs; Why are some hard-cooked eggs easier to peel than others?; What is the nutritional value of an egg?; What goes into the feed of today's laying hen?.... For answers to these questions and more link to:

[Egg Basics for the Consumer: Packaging, Storage, and Nutritional Information](#)

REF: University of California Davis, Animal Science, Publication 8154 news release, March 2005.



Tobacco Use, Access, and Exposure to Tobacco in Media Among Middle and High School Students - United States, 2004

Two of the national health objectives for 2010 are to reduce the prevalence of any tobacco use during the preceding month to $\leq 21\%$ and the prevalence of current cigarette use to $\leq 16\%$ among high school students. The National Youth Tobacco Survey (NYTS), conducted by CDC in 2004, provided estimates of current use of tobacco products and selected indicators related to tobacco use, including youth exposure to tobacco-related media and access to cigarettes. [This report](#) summarizes data from the 2004 NYTS and describes changes in tobacco use and indicators related to tobacco use since 2002. During 2002-2004, middle school students reported decreases in pipe use, seeing actors using tobacco on television or in movies, and seeing advertisements for tobacco products on the Internet. Among high school students, no changes were observed in the use of tobacco or in access to tobacco products; however, seeing actors using tobacco on television or in movies declined slightly, and seeing advertisements for tobacco products on the Internet increased. The lack of substantial decreases in the use of almost all tobacco products among middle and high school students underscores the need to fully implement evidence-based strategies (e.g., increasing the retail price of tobacco

products, implementing smoking-prevention media campaigns, and decreasing minors' access as part of comprehensive tobacco-control programs) that are effective in preventing youth tobacco use.

Editorial Note: Preventing smoking initiation and use among adolescents is critical to ending the epidemic of tobacco use in the United States. In assessing state and national tobacco-control efforts, multiple indicators are needed to evaluate progress in reducing tobacco use among adolescents, in particular, measures of exposure to influences that promote or discourage tobacco use. NYTS serves as a national evaluation tool and as a benchmark for the 29 states that implemented a comparable state Youth Tobacco Survey in 2003 and 2004. Data from two of the multiple indicators in NYTS indicated no change occurred in minors' access to cigarettes, whereas declines in seeing actors using tobacco on television or in movies occurred among both middle and high school students. Although the levels of exposure to seeing actors using tobacco decreased from 91.3% in 2002 to 86.5% in 2004 among high school students and from 89.9% in 2002 to 77.9% in 2004 among middle school students, approximately three fourths of middle and high school students are still exposed to these images.

Parental monitoring of and limitations on minors' access to media sources might reduce exposures; however, reductions in exposure large enough to effectively prevent smoking initiation might require different industry practices on smoking images in movies.

REF: MMWR, April 1, 2005, 54(12).



Water Bottles Should Be Kept Clean in Summer

One of the few downsides of warm weather occurs when the bottled water stored in your car isn't cold, but lukewarm. What happens if you are refilling your disposable water bottles and storing them in a warm or hot car? The bottles can become contaminated from the repeated handling by your hands and mouth.

According to the May issue of the University of California, Berkeley's "Wellness Letter," bacteria does not grow easily in water -- but it can thrive when saliva and food particles are present, especially when it is stored at warm temperatures.

If you are going to refill a disposable bottle, make sure you wash it thoroughly first. When washing the bottles, make sure you also wash the cap and its narrow neck.

Using the dishwasher is not recommended because the plastic is not designed for that use and has the potential of releasing potentially harmful chemicals.

REF: FSnet May 2/05



Dioxin levels in meat

Dioxin levels in meat have decreased over the past decade. In pork, the dioxin level fell by 80%, from 1.47 parts per trillion (ppt) to 0.28 ppt. In beef, residues dropped by a third, from 1.38 to 0.93 ppt. A consultant working on behalf of the Food Industry Dioxin Working Group also stated that none of the levels in food exceed the international standard for these contaminants. (*Chemical Regulation Reporter*, 3/28/05).

REF: Chemically Speaking, April 2005.



A Closer Look at Produce Washes and Rinsing Meat

Fresh and fresh-cut fruits and vegetables, traditionally considered “low risk,” are becoming more of a food safety concern. Produce items associated with foodborne outbreaks in recent years have included berries, cabbage, cantaloupe, lettuce, raw sprouts, tomatoes and watermelon. Fortunately, consumers are getting the message that it is important to wash fruits and vegetables before eating. The term “wash”, however, can have very different meanings even among the experts in the field.

This article from Colorado State University covers issues such as: What NOT to Use; Running Water – the Reliable Standard; Commercial Produce Washes; Vinegar and Lemon Juice Treatments; and Cold Storage.

Also in this same issue is an article on Rinsing Meat -- Food Safety Help or Hindrance?

Link to the following website to read the entire articles: <http://www.colostate.edu/>

REF: SafeFood News quarterly newsletter, Winter 2005



Alcohol Warning for Pregnant Women

U.S. Surgeon General Richard H. Carmona warns that **pregnant women and women who may become pregnant should abstain from alcohol** to eliminate the chance of giving birth to a baby with the harmful effects of fetal alcohol spectrum disorders (FASD). This warning updates a 1981 Surgeon General's Advisory that suggested pregnant women should **limit** the amount of alcohol they drink.

A variety of birth defects caused by prenatal alcohol exposure comprise FASD. They may include mild and subtle changes, such as a slight learning disability or physical abnormality, through full-blown fetal alcohol syndrome (FAS), which can include severe learning disabilities, growth deficiencies, abnormal facial features, and central nervous system disorders.

Researchers first recognized FAS in 1973. The discovery led to widespread public education and awareness initiatives informing women to limit the amount of alcohol they consume while pregnant.

"We do not know what, if any, amount of alcohol is safe," says Carmona. "But we do know that the risk of a baby being born with any of the fetal alcohol spectrum disorders increases with the amount of alcohol a pregnant woman drinks, as does the likely severity of the condition." When a pregnant woman drinks alcohol, so does her baby, according to Carmona.

Studies indicate that a baby could be affected by alcohol consumption within the earliest weeks after conception, even before a woman knows she is pregnant, the surgeon general says. For that reason, the warning to abstain from alcohol includes women who may become pregnant.

A number of resources are available to assist health care and social services professionals in advising their patients to refrain from drinking alcohol during pregnancy. These can be found at:

www.fascenter.samhsa.gov

www.cdc.gov/ncbddd/fas/, and

www.niaaa.nih.gov.

REF: FDA Consumer, May-June 2005.



DPR's "TOP 10" Pesticide Blunders at Home

None of the following cases resulted in death, although most victims required medical treatment. (State privacy law protects their identities.) Most cases occurred in 2003 and were compiled by California Department of Pesticide Regulation's (DPR) Pesticide Illness Surveillance Program. In no particular order, the "top 10" are:

1. As a 34-year-old Yolo County motorist moved her driver's seat backward, the motion caused an insect fogger stashed underneath the seat to discharge. She inhaled the fumes and immediately sought medical attention.
2. A mother in Merced County found a cough medicine bottle in the storage shed. That night, she gave 1/4 teaspoon of its contents to her son. When he reacted badly, she smelled the bottle and realized it contained an insecticide, which a relative had given to her husband.
3. A painting crew applied a wood preservative to a fence between two properties in Los Angeles County. The neighboring homeowner smelled a strong odor and became ill. The property owner diluted the wood preservative with paint thinner, contrary to label directions.
4. While cleaning mold underneath the kitchen sink, a 23-year-old resident of Los Angeles County inhaled the bleach fumes and developed respiratory symptoms. He wore a military-type gas mask, but still inhaled the fumes. When his symptoms worsened, he sought medical attention.
5. A Los Angeles County homeowner saw a bug in her bathroom and sprayed it with a pesticide. As the bug kept moving, the 66-year-old woman kept on spraying -- until the fumes overwhelmed her, and she immediately sought medical attention.
6. An elderly Fresno County woman entered her house to look for a cat after her son-in-law set off several insect foggers to rid the residence of roaches. She inhaled the fogger mist and began coughing. Her son-in-law called for an ambulance to take her to a hospital for treatment.
7. A Sonoma County man brought a 50/50 granular pool chlorine/water mixture home from work in a 16-ounce

bottle. The bottle sat outside in the sun for a week. When the resident opened the bottle to pour it into his spa, the contents shot out under pressure and into his unprotected eyes.

8. A Los Angeles County tenant triggered three insect foggers in her apartment kitchen without extinguishing the pilot lights. As she opened the front door to leave, the material ignited and blew out her front windows. The 32-year-old woman was taken to a hospital with chest pain.
9. A homeowner in San Luis Obispo County mixed muriatic acid and diazinon into a hand pump sprayer in hopes of doing less work in his yard. When he pressurized the sprayer, it exploded. He immediately showered and sought medical attention.
10. A 35-year-old homeowner in Sonoma County noticed that her pesticide product had settled and solidified inside the container. She mistakenly shook the container without putting the cap back on, and some of the product shot into her right eye. She immediately flushed her eyes with water.

REF: Department of Pesticide Regulation News, April 18, 2005.



Studies Provide Public With Updated Information on CCA-Treated Playground and Decks

EPA and the U.S. Consumer Product Safety Commission (CPSC) are providing updated information on the effectiveness of sealants and stains in reducing potential exposure to arsenic from chromated copper arsenate (CCA)-treated wood used in residential settings. For homeowners and others who want to reduce their potential arsenic exposure from their decks or other CCA-treated wood structures, new studies show that use, at least once a year, of an oil- or water-based, penetrating sealant or stain can reduce arsenic migrating from the treated wood. The data show that oil- or water-based sealants or stains that can penetrate wood surfaces are preferable to products such as paint, because paints and other film-formers can chip or flake, requiring scraping or sanding for removal, which can increase exposure to arsenic. Consumers should consider the required preparation steps (e.g., sanding, power washing, etc.) before selecting a product to minimize potential exposure to arsenic, both for initial application and re-coating.

This information is based on first-year results from two-year studies initiated by CPSC and EPA in 2003 to determine which stains, sealants and paints are most effective in reducing potential arsenic exposure from existing CCA-treated structures. EPA tested the performance of 12 coatings on older wood and CPSC tested eight coatings (seven were the same as the EPA group) on new (as of August 2003) CCA-treated wood. CCA was a pesticide treatment commonly used in the past to prevent deck and playground wood from rotting and insect damage. Effective Dec. 31, 2003, the use of CCA to treat virtually all wood intended for residential use was eliminated. More information for consumers and the sealant studies are available on EPA's Web site: <http://www.epa.gov/oppad001/reregistration/cca/#sealants> and on CPSC's Web site: <http://www.cpsc.gov/whatsnew.html>.

REF: EPA News Brief, 5/11/05.





Outbreak of Multidrug-Resistant *Salmonella* Typhimurium Associated with Rodents Purchased at Retail Pet Stores United States, December 2003-October 2004

During 2004, the Minnesota Department of Health (MDH) Public Health Laboratory notified CDC about the isolation of multidrug-resistant *Salmonella enterica* serotype Typhimurium from ill hamsters from a Minnesota pet distributor. [This report](#) describes two of the first identified human cases associated with this outbreak, summarizes the multistate investigation of human *S. Typhimurium* infections associated with exposure to rodents (e.g., hamsters, mice, and rats) purchased at pet stores, and highlights methods for reducing *Salmonella* transmission from pet rodents to their owners. This is the first documented salmonellosis outbreak associated with pet rodents. Findings demonstrate that the handling of pet rodents is a potential health risk, especially for children.

Case Reports

South Carolina. During June 2004, a boy aged 4 years was hospitalized for 5 days with fever (105°F [40.6°C]), watery diarrhea, and abdominal cramping. A stool culture yielded *S. Typhimurium*. Nine days before the boy's illness, his family had purchased a hamster from a retail pet store supplied by an Arkansas distributor; the hamster was found dead 2 days after purchase.

Minnesota. During August 2004, a boy aged 5 years had diarrhea of 14 days' duration (initially bloody), abdominal cramps, vomiting, and fever (103°F [39.4°C]). A stool culture yielded *S. Typhimurium*. Four days before the boy became ill, his family had purchased a mouse from a retail pet store supplied by a Minnesota distributor. The mouse became lethargic and had diarrhea immediately after purchase. Even though the mouse was ill, the boy frequently handled and kissed the mouse. One week after purchase, the mouse died; the mouse was frozen and later submitted for testing at MDH. Cultures of the mouse's lungs, pooled liver and spleen, and intestines yielded growth of *S. Typhimurium*, with a pulsed-field gel electrophoresis (PFGE) pattern indistinguishable from the boy's isolate.

Hamster Salmonellosis

On August 30, a veterinarian for the Minnesota pet distributor called MDH about isolation of *Salmonella* from two ill hamsters submitted to the University of Minnesota Veterinary Diagnostic Laboratory (UMVDL). The hamsters were part of a shipment of 780 received on August 1 from an Iowa pet distributor. A total of 243 hamsters from this shipment were subsequently sent from the Minnesota distributor to 15 retail pet stores in four midwestern states. Distribution of rodents from the Minnesota distributor ceased on August 23 after numerous hamster deaths. Diarrhea was present in the majority of ill hamsters. By August 29, approximately 320 (60%) of the remaining 537 hamsters at the Minnesota distributor had died; the other hamsters were euthanized.

Epidemiologic Investigation

Based on recognition of the Minnesota and South Carolina human cases, CDC and MDH conducted a national search for additional human cases associated with exposure to rodents. A review of isolates submitted to the PulseNet National *Salmonella* Database in 2004 revealed 28 matching human case-isolates of *S. Typhimurium* from 19 states; patient

illness onset dates ranged from December 2003 to October 2004. Of 22 patients interviewed, 13 (59%) had been exposed to rodents purchased from retail pet stores; all exposures occurred during the 8 days before illness onset. Two (9%) patients acquired salmonellosis through secondary exposure. Seven (32%) of the 22 patients had no identified rodent exposure. Four patients remained under investigation, and two were lost to follow-up.

Editorial Note: Each year, an estimated 1.4 million persons in the United States have salmonellosis, leading to approximately 14,800 hospitalizations and 415 deaths. *Salmonella* is found in the intestinal tract of animals and is transmitted by ingestion of feces, which might occur from eating contaminated foods or through contact with animals or their environments. Exposure to animals with higher frequency of *Salmonella* shedding in their feces increases the risk for acquiring salmonellosis; among pets, these include reptiles, young animals, and animals with diarrhea. In addition to reptiles, salmonellosis outbreaks have been reported after handling of pet chicks, ducklings, kittens, and hedgehogs.

Cases described in this outbreak were dispersed temporally and geographically, and rodent purchases occurred through multiple retail pet store chains and pet distributors; these factors might reflect the geographic spread of *S. Typhimurium* from a common source of infection occurring earlier in the chain of pet distributors or breeders. The recovery of *S. Typhimurium* from reusable transport containers, cages, and bins contaminated with rodent droppings offers a potential mechanism for both the environmental persistence and geographic spread of *Salmonella*. Rodents subsequently transported or housed in contaminated containers might have been exposed to *Salmonella* and become infected without direct contact with infected rodents.

Consumers and animal workers should be aware that rodents, like reptiles, can shed *Salmonella*; therefore, they should expect rodent feces to be potentially infectious. *Salmonella* transmission to humans can be reduced by thoroughly washing hands with soap and water after handling rodents or their cages or bedding. Young children who are unable to reliably wash their hands should avoid contact with rodent feces. Additional public health recommendations for preventing salmonellosis from reptiles might also be appropriate for preventing salmonellosis from pet rodents.

REF: MMWR, 54(17), May 6, 2005



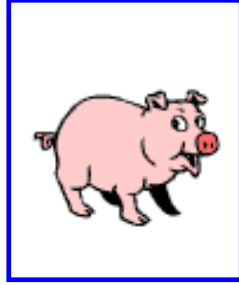
Stay Healthy at Animal Exhibits this Summer! Tips from CDC

Exhibits such as petting zoos and fairs allow children of all ages to have the thrilling experience of coming face to face with animals. This interaction allows people to learn more about animals and helps to build an important human-animal bond. Unfortunately, many people become sick every year because of a visit to an animal exhibit. It is important to remember that animals sometimes carry germs that are harmful to humans. When people forget to wash their hands after petting an animal or bring food into an area where animals are being housed, they are at risk for becoming ill. Let's make this spring and summer healthier seasons! For some tips to help you prevent illness when visiting animal exhibits link to: http://www.cdc.gov/healthypets/spotlight_an_exhbts.htm

REF: National Food Safety Educator's Network, 30 Mar 2005



!! CLICK ON THE PIG !!



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