Environmental Toxicology Newsletter

"Published Occasionally at Irregular Intervals"
~ Dr. Arthur L. Craigmill ~
Extension Toxicologist

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OUR MOST IRREGULAR INTERVAL EVER !!

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Multistate Outbreak of Human *Salmonella* Infections
Associated with Exposure to Turtles - United States, 2007-2008

Turtles and other reptiles have long been recognized as a source of human *Salmonella* infections. To prevent turtle-associated *Salmonella* infections in humans, the sale and distribution of small turtles (i.e., those with a carapace length of less than 4 inches, [Figure 1]) has been prohibited in the United States since 1975. Despite this prohibition, small turtles remain available to the public from various sources, including pet shops, flea markets, street vendors, and Internet websites. In October 2007, the North Carolina Division of Public Health (NCDPH) notified CDC of human infections caused by *Salmonella* Paratyphi B var. Java in several states. *Salmonella* Paratyphi B var. Java is a nontyphoidal strain of *Salmonella* that causes gastroenteritis. This report describes the results of the epidemiologic and laboratory investigation conducted by CDC and state and local health departments during October 2007-January 2008. Many of these infections have occurred in young children and have been associated with exposure to small turtles. Prohibiting the sale and distribution of small turtles likely remains the most effective public health action to prevent turtle-associated salmonellosis.

Detection of the Outbreak
On August 31, 2007, a girl aged 13 years visited a South Carolina hospital emergency department, where she reported a 5-day history of bloody diarrhea, abdominal cramps, fever, and vomiting. She was treated with trimethoprim-sulfamethoxazole and intravenous fluids but was not hospitalized. Her illness resolved in 7 days. A stool specimen yielded *Salmonella* Paratyphi B var. Java. Also on August 31, a girl aged 15 years was admitted to a North Carolina hospital with acute renal failure and a 4-day history of bloody diarrhea, abdominal cramps, fever, and vomiting. She was hospitalized for 8 days and recovered fully. A joint investigation by NCDPH and the South Carolina Department of Health and Environmental Control revealed that, on August 24, the two girls had swum in an unchlorinated, in-ground swimming pool belonging to the family of the older girl. Two pet turtles belonging to the family also were permitted to swim in the pool. The turtles, both of which had carapace lengths of less than 4 inches, had been purchased recently from a pet shop in South Carolina. A water sample
collected from the turtle habitat yielded *Salmonella* Paratyphi B var. Java with an *Xba*I pattern indistinguishable by pulsed-field gel electrophoresis (PFGE) from the isolates of the younger girl.

**Editorial Note:** The prohibition on the sale and distribution of small turtles was enacted in 1975, after public health investigations demonstrated that small turtles were a major source of human *Salmonella* infections, particularly in children. In 1972, a study in New Jersey indicated that small pet turtles accounted for approximately 23% of *Salmonella* infections in children. In 1980, the 1975 prohibition was estimated to have prevented 100,000 *Salmonella* infections in U.S. children each year since going into effect. However, this prohibition has an exception: small turtles may be sold legally for scientific, educational or exhibition purposes. During 2001-2006, the number of turtles kept as pets in the United States increased 86% to nearly 2 million turtles, suggesting that this exception might provide a mechanism by which small turtles become household pets.

Turtles, like other reptiles, commonly carry *Salmonella*, and fecal carriage rates can be as high as 90%. Small turtles sold as pets frequently come from breeding farms, where turtles are housed in crowded ponds and nesting areas in a way that promotes *Salmonella* transmission. Attempts to treat turtles, turtle eggs, and turtle breeding ponds with antibiotics to eliminate *Salmonella* have not been successful and have resulted in a high prevalence of antibiotic resistance. Other treatments reduce but do not eliminate *Salmonella* shedding from turtles, and the turtles that continue to shed *Salmonella* might recontaminate other turtles during rearing or shipment. Because *Salmonella* shedding might be intermittent and stress related, determining whether turtles are free of the bacteria is difficult.

Direct or indirect contact with a reptile is associated with an estimated 6% of human *Salmonella* infections in the United States. Persons coming into contact with reptiles, reptile habitats, or surfaces contaminated with reptile fecal matter risk infection from salmonellae shed by the reptile. Although most reptiles carry *Salmonella*, small turtles are likely to be handled differently than other reptiles and thus carry a greater risk of transmitting *Salmonella* to children. In contrast to the obvious risk for a bite or scratch, for example, from a snake or an iguana, a small turtle is likely to be perceived as safe, and thus might be given directly to small children to play with. In addition, a young child placed in charge of caring for a turtle has direct contact with water in the turtle habitat, where *Salmonella* are likely to multiply to high numbers. Although approximately half of the infections associated with this outbreak occurred in young children, who are at greater risk for severe illness from *Salmonella* infection, several illnesses occurred in adults with turtle exposure, demonstrating that turtle-associated *Salmonella* infection is not unique to children. Additionally, only 20% of case-patients interviewed reported awareness of the link between *Salmonella* and contact with reptiles, indicating that measures to educate the public about this link have not been successful.
Acute Pesticide Poisoning Associated with Pyraclostrobin Fungicide - Iowa, 2007

Pyraclostrobin is an agricultural pesticide product used to kill fungi (e.g., blights, mildews, molds, and rusts). Hazards to humans from pyraclostrobin exposure include eye injury and skin irritation. In July 2007, the Iowa Department of Public Health (IDPH) received reports of five events involving pyraclostrobin that sickened 33 persons, including 27 migrant workers who were exposed in a single incident during aerial application (i.e., crop dusting).

Event A. On July 23, 2007, IDPH received media reports that migrant workers in a field had been inadvertently exposed to pyraclostrobin fungicide by a crop-duster plane on July 22. An IDPH investigation identified 27 cases of acute illness among the potentially exposed workers; all illnesses were associated with off-target drift of the pyraclostrobin to an adjacent field, owned by a different grower, where workers were detasseling field corn. IDPH learned that the pilot had seen the nearby workers yet proceeded to apply the fungicide. Some workers reported feeling wet droplets on their skin and seeing mist coming from the aircraft.

All 27 persons with acute illness were Hispanic and residents of Texas. Twenty were male, and seven were female; median age was 46 years (range: 15-74 years). All received skin decontamination on-site by a hazardous materials team before being transported to an emergency department for observation until their symptoms resolved. All cases were categorized as being of low severity. The most common symptom was upper respiratory
tract pain or irritation (26 patients), followed by chest pain (20 patients). Three patients had nausea, and one patient each had pruritis, skin redness, eye pain, weakness, headache, dizziness, and chest pain.

The Iowa Department of Agriculture and Land Stewardship (IDALS) began an investigation on July 23 that included collection of soil and vegetation samples from the cornfield where the detasslers had been working and samples of worker safety glasses and hats. All samples tested positive for pyraclostrobin, even though the samples were collected the day after pyraclostrobin application and after substantial evening rainfall. Before this incident, the field had not been treated with pesticide (i.e., herbicides containing atrazine and topramezone) for 40 days. On August 1, IDALS suspended the commercial pesticide applicator license of the crop-dusting company that applied the fungicide; an administrative law judge later revoked the license.

**Event B.** On July 20, a crop-duster pilot aged 55 years visited an emergency department with first-degree chemical burns after skin and inhalational exposure to pyraclostrobin fungicide that occurred when his plane crashed during takeoff, spilling the liquid fungicide. Emergency department personnel consulted the Iowa Poison Center (IPC), and IDPH was notified of the case. The pilot was admitted to the hospital for observation for 2 days, and the case was categorized as being of moderate severity. Although inhalational exposure occurred, the pilot reported no respiratory symptoms.

**Events C, D, and E.** During July 2007, IPC notified IDPH of three additional events involving five cases of acute pesticide poisoning associated with pyraclostrobin exposure that resulted from off-target drift of pyraclostrobin from nearby aerial applications. All five illnesses were of low severity; all persons who were exposed consulted IPC but did not otherwise seek medical care. On July 5, a man aged 54 years experienced headache and eye pain after pyraclostrobin exposure while riding a motorcycle near a field. On July 12, a woman aged 40 years reported eye pain and headache, and a man aged 49 years reported eye pain, headache, and dizziness after pyraclostrobin drifted into the yard of their home. On July 14, a man and woman both aged 20 years reported eye pain and conjunctivitis after pyraclostrobin drifted into the yard of their home. In all five of these cases, symptoms subsided after the exposed persons moved indoors or away from the pyraclostrobin-treated fields.

**Editorial Note:** The cases described in this report are the first published accounts of human illness caused by exposure to pyraclostrobin or any of the other strobilurin chemical compounds used as agricultural fungicides. Pyraclostrobin has a toxicity category of II; the product label warns that pyraclostrobin exposure can cause substantial, although temporary, eye injury and skin irritation but can be fatal if swallowed. Contact with eyes, skin, or clothing should be avoided. After a cornfield has been treated with pyraclostrobin, workers should be prohibited from entering that field for 7 days to perform detasseling unless they are wearing appropriate personal protective equipment (i.e. coveralls and chemical-resistant gloves). Although upper respiratory symptoms are not mentioned on the product label warnings, 26 of the 27 workers exposed in event A experienced these symptoms, perhaps as a result of irritation of the upper respiratory mucosa by a mechanism similar to that causing skin and eye irritation.

The strobilurin fungicides, including pyraclostrobin, are relatively new to the U.S. agricultural market. Pyraclostrobin was approved for sale in the United States in 2002 for use on a limited number of crops but was not approved for use on corn until December 2004. During 2007, the first year of widespread use on field corn, pyraclostrobin was applied to an estimated 1.5 million acres of corn in Iowa. Increased use of pyraclostrobin on corn likely is attributable to several factors, including increased planting of corn in the same field in successive seasons, which is associated with increased fungal disease risk to the corn plant; high demand for corn to produce corn-based ethanol; and aggressive fungicide marketing by agricultural-chemical dealers. In addition, strobilurin fungicides, especially pyraclostrobin, might increase corn yield in the absence of disease by directly stimulating plant growth, although field trials to document this have produced inconsistent results. No cases of illness related
to exposure to trifloxystrobin and azoxystrobin, the other two strobilurin fungicides licensed in Iowa, were reported to IDPH during 2006 or 2007.

The 27 workers sickened in event A were detasseling corn (i.e., removing tassels from corn plants to prevent auto-pollination and enable hybridization). Although the field where these workers were detasseling had been treated previously with atrazine and topramezone, both of which can produce mucosal irritation, 40 days had elapsed since that treatment. Workers may return to a field 12 hours after such treatments. Therefore, these herbicides were unlikely to be responsible for the illnesses reported July 22.

To read this entire article please link to: MMWR Weekly Report


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**Carbon Monoxide-Related Deaths - United States, 1999-2004**

Carbon monoxide (CO) is a colorless, odorless, tasteless toxic gas produced by incomplete combustion in fuel-burning devices such as motor vehicles, gas-powered furnaces, and portable generators. Persons with CO poisoning often overlook the symptoms (e.g., headache, nausea, dizziness, or confusion), and undetected exposure can be fatal. Unintentional CO exposure accounts for an estimated 15,000 emergency department visits and 500 unintentional deaths in the United States each year.

During 1999-2004, CO poisoning was listed as a contributing cause of death on 16,447 death certificates in the United States. Of these, 16,400 (99.7%) deaths occurred among U.S. residents inside the United States, and 2,631 (16%) were classified as both unintentional and non-fire-related deaths. For the period 1999-2004, an average of 439 persons died annually from unintentional, non-fire-related CO poisoning (range: 400 in 1999 to 473 in 2003). The annual average age-adjusted death rate in the U.S. was 1.5 deaths per million persons. Death rates were highest for adults aged ≥65 years and for men. Age-adjusted death rates were higher for non-Hispanic blacks and non-Hispanic whites than for other subgroups; however, the difference between the rates for blacks and whites was not statistically significant. The average daily number of CO-related deaths was greatest during the months of January (2.07 deaths) and December (1.97 deaths) and lowest during the months of July (0.67 deaths) and August (0.67 deaths). For the period 1999-2004, a total of 35 states had sufficient numbers of CO-related deaths to calculate reliable mortality rates. The state with the highest reliable CO mortality rate was Nebraska, and the state with the lowest reliable rate was California. As of December 2007, reporting of acute CO poisoning by health-care providers was mandatory for 13 states; no clear pattern of differences in CO-related mortality was detected between states with mandatory reporting and those without.

**Editorial Note:** Consistent with previous studies, the results of this analysis indicate that men and adults aged ≥65 years were more likely to die from CO poisoning than other persons. The higher rate in men has been attributed to high-risk behaviors among men, such as working with fuel-burning tools or appliances. The higher rate among older persons has been attributed to the likelihood of older adults mistaking symptoms of CO poisoning for other conditions common among persons in this age group (e.g., influenza-like illnesses or fatigue). CO deaths were highest during colder months, likely because of increased use of gas-powered furnaces...
and use of alternative heating and power sources used during power outages, such as portable generators, charcoal briquettes, and propane stoves or grills. Similar to previous findings, the highest CO death rates tended to be among western (e.g., Alaska, Montana, and Wyoming) and midwestern (e.g., Nebraska and North Dakota) states, likely because of variations in weather and geography and state-by-state variations in prevalence of certain risk behaviors.

Because persons are relying on CO alarms to prevent CO poisoning, additional research regarding their effectiveness is needed, including an evaluation of the cost effectiveness of CO alarms used in residences. As additional years of data become available, tracking of longitudinal trends in CO-related mortality should continue to guide public health measures aimed at preventing deaths from CO poisoning.

Exposure to CO can be prevented with basic precautions, including proper installation and maintenance of fuel-burning appliances. CO detectors can alert occupants to accumulating gas and should be placed on every level of a home. Additional measures to educate the public regarding the dangers of CO are needed, particularly during the winter season. Additional surveillance that combines timely estimates of morbidity and mortality with situational information related to mechanisms of CO exposure (e.g., length of exposure, type of fuel-burning device involved, and behaviors or chain of events preceding exposure) could help target prevention measures and reduce CO poisonings.

To read this entire article please link to: MMWR Weekly Report


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Cigarette Smoking Among Adults - United States, 2006

One of the national health objectives for 2010 is to reduce the prevalence of cigarette smoking among adults to <12%. To assess progress toward achieving this objective, CDC analyzed data from the 2006 National Health Interview Survey (NHIS). This report summarizes the results of that analysis, which indicated that in 2006, approximately 20.8% of U.S. adults were current cigarette smokers. This prevalence had not changed significantly since 2004, suggesting a stall in the previous 7-year (1997-2004) decline in cigarette smoking among adults in the U.S. In addition, the findings indicated that persons with a diagnosis of a smoking-related chronic disease have a significantly higher prevalence of being a current smoker than persons with other chronic diseases or persons with no chronic disease. To reduce smoking prevalence further in the United States, comprehensive, evidence-based approaches for preventing smoking initiation and increasing cessation, including clinical interventions for populations at high risk, need to be fully implemented.

Editorial Note: Cigarette smoking remains the leading preventable cause of disease and death in the United States, resulting in approximately 438,000 deaths annually. The prevalence of cigarette smoking remained relatively unchanged during the early 1990s but gradually decreased from 1997 (24.7%) to 2004 (20.9%). This report indicates that the prevalence of current smoking among U.S. adults in 2006 (20.8%) was not significantly different from the prevalence in 2004 (20.9%), suggesting a stall in previous declines. This lack of a decrease in cigarette use during 2 years might be a result of several factors. Most notably, funding for
comprehensive state programs for tobacco control and prevention decreased by 20.3% from 2002 to 2006, and tobacco-industry marketing expenditures nearly doubled from 1998 ($6.7 billion) to 2005 ($13.1 billion). In 2005, approximately 81% ($10.6 billion) of tobacco-industry marketing expenditures were related to discounting strategies (e.g., coupons, two-for-one offers, or promotional discounts for retailers or wholesalers) that reduce the impact of increases in the unit price of tobacco, which are effective in preventing initiation of smoking and increasing cessation.

Among smokers who already have a smoking-related chronic disease, those who quit have a lower risk for death from the disease than those who continue smoking. Smokers who quit have a slower rate of decline in lung function and a lower incidence of bronchitis, emphysema, and other respiratory conditions than persons who continue to smoke. Among smokers with CHD, those who quit have a lower risk for further CHD-related morbidity and mortality than those who continue to smoke. In addition, smokers who have cancer and who continue smoking during treatment decrease treatment effectiveness, overall survival prognosis, and quality of life and increase the risk for having another malignancy or comorbid condition. The continuation of smoking among those who have smoking-related chronic diseases described in this report highlights the need for health-care providers to emphasize the importance of quitting. Health-care providers should repeatedly offer intensive smoking-cessation interventions to all of their patients, especially those with smoking-related chronic diseases who continue to smoke.

To read this entire article please link to: MMWR Weekly


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**Top Pesticide Blunders - Think Before You Spray!**

The California Department of Pesticide Regulation has released its latest list of “top pesticide blunders” to help people avoid needless injury and illness. Their health and safety scientists say a few simple precautions can prevent most pesticide accidents in and around your home:

- Don’t use a pesticide unless you really need it -- look for the least-toxic solution to pest problems, indoors and out.
- Keep pesticides in their original containers to avoid mistaking them for snacks. And ALWAYS keep pesticides out of children's reach.
- If you must use a pesticide product, read all label directions closely, follow those directions to the letter, and stay alert while using the product.

"Pesticides include a wide variety of over-the-counter products - including mold and mildew cleaners, disinfectants, weed killers and pool chemicals - that can be used safely, but only if consumers recognize them as toxic chemicals," said DPR Director Mary-Ann Warmerdam. "Careless misuse of these products can expose homeowners, children and pets to serious hazards."

To help consumers avoid mistakes, DPR offers these "top pesticide blunders" from our illness report database:

1. When Orange County residents complained of a raccoon problem, a friend overseas sent them a black, granular pesticide. The wife mixed it with meat as bait for raccoons. The raccoons did not eat it, so she labeled
and froze the meatballs. Some time later, her husband cooked and ate the meatballs. He became seriously ill and drove to a hospital. (Suspected pesticide-poisoning victims should never drive themselves to treatment, since they may be impaired by the toxin.) This victim survived both his mistakes. Later analysis of the pesticide showed that it was nine percent aldicarb, a highly toxic insecticide; one teaspoon of the pure ingredient could kill five healthy adults.

2. In Los Angeles County, a woman put some insecticide into a soft drink bottle and gave it to her sister to take home. The sister left the bottle on a table, where her husband and four-year-old daughter drank from it. They recognized their mistake and made themselves vomit before going to an emergency room; both recovered. (However, some liquid pesticides pose a risk to the lungs from induced vomiting. Pesticide labels provide treatment instructions, but these victims did not have a labeled container. Fortunately, they had no further health problems from their pesticide exposure.)

3. In San Joaquin County, an apartment dweller set off a "bug bomb" sitting on top of his gas stove. When the aerosol came in contact with the stove’s pilot light, the resulting blast blew out the apartment’s windows, pushed out walls and raised the roof. A neighbor’s windows also blew out, according to firefighters who responded to the scene. "Bug bombs" should never be used in any structure until all ignition sources -- including gas pilot lights -- are turned off.

4. A Kern County homeowner left a container of pool chlorine powder in the sun on a warm day. When he opened the container, the heated and pressurized powder blew into his face and eyes. He sought medical treatment for symptoms that included eye irritation.

5. An Imperial County homeowner activated six "bug bombs" inside his kitchen cabinets without turning off the gas stove’s pilot light. He then waited at the kitchen entrance because he wanted to see the cockroaches die. The pilot light ignited the fogger propellant, causing extensive damage. The victim suffered burns to his face, arms and legs, but he did not require hospitalization.

6. A Los Angeles woman poured a bleach solution into a water bottle to sanitize it. When she placed several drinking water bottles in her refrigerator, she mistakenly included the one containing sanitizer as well, and later took a drink of the bleach.

7. A Monterey County apartment resident poured three cleaning products into a toilet bowl -- an inappropriate mix -- left the bathroom, and returned a short time later. When she entered the room, she inhaled the vapors from the chemical reaction, began to experience breathing problems, and had to call 911 for assistance.

These incidents occurred in 2006 and 2007. As always, DPR observes medical privacy law and does not reveal victim identities. A summary of all 2006 illness reports has been posted at www.cdpr.ca.gov/docs/whs/pisp.htm

For more information on home and garden pesticide safety, see DPR consumer fact sheets at www.cdpr.ca.gov/docs/dept/factshts/factmenu.htm

Reference: California Department of Pesticide Regulation News, March 25, 2008
Annual Summary, Calendar Year 2006

In 1991, the U.S. Department of Agriculture (USDA) Agricultural Marketing Service (AMS) was charged with designing and implementing the Pesticide Data Program (PDP) to collect data on pesticide residues in food. This 16th summary presents results for samples collected in 2006.

Data Uses: PDP data are used primarily by EPA to prepare realistic pesticide dietary exposures and continue pesticide re-registration activities in accordance with the 1996 Food Quality Protection Act (FQPA). PDP provides high-quality data on residues in food, particularly foods most likely consumed by infants and children, including minor crops. Minor crops are those grown on 300,000 acres or less in the U.S., for example, many fruit and vegetable crops are defined as minor crops.

PDP data are also used by the U.S. Food and Drug Administration (FDA), USDA’s Economic Research Service (ERS) and Foreign Agricultural Service (FAS), participating States, academic institutions, chemical manufacturers, environmental interest groups, food safety organizations, and groups within the private sector representing food producers. PDP data are used by the U.S. Government and the agricultural community to examine pesticide residue issues affecting agricultural practices, integrated pest management and U.S. trade, particularly in the competitive global market. PDP additionally provides support for USDA’s participation in the Codex Alimentarius Commission.

Risk Assessment: In estimating the potential risks of consumption of pesticide residues from food, EPA uses a step-wise tiered approach. As a first step, EPA may use a conservative, worst-case scenario and assume that a pesticide is applied to the fullest extent permitted by the pesticide label; that is, on every acre of each approved crop at the maximum rate and frequency allowed. EPA may also assume that residues on treated crops are present at the maximum allowable level. Exposure estimates based on such assumptions are likely to significantly exceed actual exposure. When an initial assessment indicates a potential risk, EPA refines its assessment using more realistic exposure data. Refinements may include the use of additional data such as: (1) the percent of a crop treated with a pesticide; (2) studies of the effects of washing, cooking, processing, and storage; and (3) residue monitoring data. During the refinements of this exposure assessment, PDP data can be pivotal. PDP sampling procedures were designed to capture residues in the food supply as close as possible to the time of consumption. PDP concentrates its efforts to provide realistic pesticide residue data on foods that are most often consumed by infants and children and incorporates recommendations made in 1993 by the National Academy of Sciences (NAS) in its report “Pesticides in the Diets of Infants and Children.”

Participants: In 2006, sampling and/or testing program operations were carried out with the support of 12 States: California, Colorado, Florida, Maryland, Michigan, Minnesota, Montana, New York, Ohio, Texas, Washington, and Wisconsin. Grain sampling was performed by USDA’s Grain Inspection, Packers, and Stockyards Administration (GIPSA) and poultry sampling by USDA’s Food Safety and Inspection Service (FSIS). Two Federal laboratories also provided testing services: USDA’s AMS National Science Laboratory and USDA’s GIPSA Laboratory. Participating water utilities provided drinking water samples which were tested by the Colorado, Montana, and New York State laboratories. Bottled water samples were collected at food distribution centers and tested by the Minnesota laboratory. MPO is responsible for administering the program, coordinating sampling activities, directing technical performance issues and quality assurance measures, and managing database activities.

Sampling: PDP commodity sampling is based on a rigorous statistical design which ensures that the data are reliable for use in exposure assessments and that they can be used to draw various conclusions about the Nation’s food supply. Pesticides and commodities included each year in PDP are selected based on EPA data needs and on information about the types and amounts of food consumed by infants and children. Fruit and vegetable, peanut butter, and bottled water samples collected by each of the 10 sampling States (California, Colorado,
Florida, Maryland, Michigan, New York, Ohio, Texas, Washington, and Wisconsin) are apportioned according to that State’s population. Samples are randomly chosen close to the time and point of consumption (i.e., distribution centers rather than at farmgate) and reflect what is typically available to the consumer throughout the year. Samples are selected without regard to country of origin, variety, or organic labeling. The monthly sampling rate is 62 samples per commodity, except for highly seasonal commodities. For seasonal commodities, sampling rates are adjusted to reflect market availability. Sampling rates for grain and meat are based on production.

**Results:** During 2006, PDP tested fresh and processed fruit and vegetables, peanut butter, wheat grain, poultry, bottled water, and treated (finished) and untreated drinking water for various insecticides, herbicides, fungicides, and growth regulators. Of the 13,658 total samples collected and analyzed, 9,818 were fruit and vegetable commodities including applesauce, bananas, broccoli, carrots, cauliflower, cranberries, eggplant, grapefruit, greens (collard/kale), orange juice, peaches, fresh and dried plums (prunes), frozen potatoes, raisins, spinach, summer squash, frozen sweet peas, watermelon, and winter squash. PDP also tested 739 peanut butter, 687 wheat grain, 1,310 poultry (paired breast/thigh samples), 367 bottled water, and 737 treated (finished) and untreated drinking water samples.

Excluding drinking water samples, which were all from U.S. sources, approximately 80 percent of all samples tested were from U.S. sources, 18 percent were imports, 1 percent were of mixed origin, and 1 percent were of unknown origin. Approximately 32 percent of the orange juice samples were of mixed national origin.

Overall, 64 percent of fresh fruit and vegetables and 59 percent of processed fruit and vegetables showed detectable residues. Residues were detected in 30 percent of the peanut butter samples, 69 percent of wheat grain samples, 7 percent of the poultry breast and thigh samples, and 19 percent of the bottled water samples.

Excluding drinking water, 46 percent of all samples tested contained no detectable pesticides [parent compound and metabolite(s) combined], 28 percent contained 1 pesticide, and 26 percent contained more than 1 pesticide. Low levels of environmental contaminants were detected in broccoli, carrots, kale greens, peaches, frozen sweet peas, spinach, watermelon, winter squash, peanut butter, and poultry at concentrations well below levels that trigger regulatory actions.

Excluding samples for which no tolerances are set (bottled water and treated/untreated drinking water), **residues exceeding the tolerance were detected in 0.2 percent of the 12,554 samples tested in 2006, 31 samples with 1 residue each.** 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 3.1 percent of the samples (367 samples with 1 residue each, 17 samples with 2 residues each, 2 samples with 3 residues each, and 1 sample with 4 residues). In most cases, these residues were detected at very low levels and some residues might have resulted from spray drift or crop rotations. PDP communicates these findings to FDA when they are reported by testing laboratories.

For bottled water, 12 different residues from 6 different pesticides were detected. Most samples with detectable residues contained only a single pesticide or metabolite. All detections were well below established FDA Standards of Quality (SOQs). In finished drinking water, PDP detected low levels (measured in parts per trillion) of some pesticides, primarily widely used herbicides and their metabolites. Forty-eight different residues were detected in the untreated intake water and 39 in the treated water. The majority of pesticides, metabolites, and isomers included in the PDP testing profiles were not detected. None of the detections in the finished water samples exceeded established EPA Maximum Contaminant Levels (MCL) or Health Advisory (HA) levels or established Freshwater Aquatic Organism (FAO) criteria.

**Data Availability:** PDP continuously strives to improve methods for the collection, testing, and reporting of data. These data are freely available to EPA and other Federal and State agencies charged with regulating and
setting policies on the use of pesticides. They also are available to all stakeholders by hard copy, Internet, or custom reports generated by MPO. This publication, the PDP database file for 2006, and annual summaries and database files for previous years are available on the PDP Web site at www.ams.usda.gov/pdp.

Reference: USDA Agricultural Marketing Service Pesticide Data Program website.

TOXICOLOGY TIDBITS

Perchlorate
Questions and Answers

1. What are the effects of perchlorate on the human body?
2. Has a safe level for perchlorate in water and food been established?
3. The EPA's drinking water equivalent level for perchlorate is 24.5 parts per billion (ppb). Is this the standard for perchlorate in bottled water?
4. In some areas of California, perchlorate has been found in tap water. Do bottled water manufacturers test for perchlorate?
5. Has FDA developed a method to detect perchlorate in foods?
6. What is FDA's Total Diet Study?
7. Did FDA test TDS foods for perchlorate and iodine?
8. What were the estimates of the dietary intake of perchlorate from the "U.S. Food and Drug Administration's Total Diet Study: Dietary Intake of Perchlorate and Iodine" study?
9. What were the estimates of the dietary intake of iodine from the "U.S. Food and Drug Administration's Total Diet Study: Dietary Intake of Perchlorate and Iodine" study?
10. What is FDA recommending to consumers?
11. How did FDA conduct the exploratory surveys for perchlorate in 2004 and 2005?
12. Has FDA informed the public of the perchlorate levels that have been found in foods from the exploratory surveys?
13. What was the exposure estimate based on the exploratory surveys and how did it compare to EPA's RfD?
14. Did the perchlorate levels in the 27 foods and beverages analyzed from the exploratory surveys provide an accurate measure of exposure to perchlorate?

Perchlorate is a naturally occurring and manmade chemical. Naturally occurring perchlorate, for example, is found in arid states in southwestern United States, as well as in nitrate fertilizer deposits in Chile and potash ore found in U.S. and Canada. Perchlorate can also form naturally in the atmosphere, leading to trace levels of perchlorate in precipitation. Perchlorate is also an industrial chemical that is used as an oxidizing agent in rocket propellant, in fireworks and flares, and for other purposes. It has been detected in a variety of foods and in drinking water from some locations in the U.S.

In order to work toward development of an assessment of the potential risk of perchlorate, the Food and Drug Administration (FDA) started an initial exploratory survey in 2004 and expanded the exploratory survey in 2005 to better understand the occurrence and levels of perchlorate in a variety of foods from various locations. In 2005 and 2006, FDA conducted Total Diet Study (TDS) surveys to obtain perchlorate levels in TDS foods that are
more comprehensive and nationally representative (see Question 6). The levels of perchlorate found in the foods are analyzed to better understand perchlorate exposure from food and to support action, if warranted, to protect the public health.

Based on the perchlorate data obtained from the exploratory and TDS surveys, the estimated average perchlorate intakes by the U.S. population were below the perchlorate reference dose (RfD) of 0.7 micrograms per kilogram body weight per day (µg/kg bw/day) recommended by the National Academy of Sciences and adopted by the U.S. Environmental Protection Agency (see questions 2, 8, and 13).

For this entire updated (February 7, 2008) report please link to: CFSAN/Office of Plant & Dairy Foods

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**How Safe Are Color Additives?**

This handbook provides basic facts regarding foodborne pathogenic microorganisms and natural toxins. It brings together in one place information from the Food & Drug Administration, the Centers for Disease Control & Prevention, the USDA Food Safety Inspection Service, and the National Institutes of Health. How Safe are Color Additives?

Color additives give the red tint to your fruit punch and the green hue to your mint-flavored toothpaste. They are dyes, pigments, or other substances that can impart color when added or applied to a food, drug, cosmetic, or the human body. They can be found in a range of consumer products — from cough syrup and eyeliner to contact lenses and cereal. This publications "How Safe are Color Additives?" has been recently updated by the US Food and Drug Administration.

REFERENCE: FDA website

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**FDA Issues Documents on the Safety of Food from Animal Clones**

*Agency Concludes that Meat and Milk from Clones of Cattle, Swine, and Goats, and the Offspring of All Clones, are as Safe to Eat as Food from Conventionally Bred Animals*

After years of detailed study and analysis, the Food and Drug Administration has concluded that meat and milk from clones of cattle, swine, and goats, and the offspring of clones from any species traditionally consumed as food, are as safe to eat as food from conventionally bred animals. There was insufficient information for the agency to reach a conclusion on the safety of food from clones of other animal species, such as sheep.

To read the entire article please link to: Safety of Food from Animal Clones

Also: Animal Cloning and Food Safety
Antibacterial Chemical Disrupts Hormone Activities

A new UC Davis study shows that a common antibacterial chemical added to bath soaps can alter hormonal activity in rats and in human cells in the laboratory -- and does so by a previously unreported mechanism.

The findings come as an increasing number of studies -- of both lab animals and humans -- are revealing that some synthetic chemicals in household products can cause health problems by interfering with normal hormone action.

Called endocrine disruptors, or endocrine disrupting substances (EDS), such chemicals have been linked in animal studies to a variety of problems, including cancer, reproductive failure and developmental anomalies.

This is the first endocrine study to investigate the hormone effects of the antibacterial compound triclocarban (also known as TCC or 3,4,4'-trichlorocarbanilide), which is widely used in household and personal care products including bar soaps, body washes, cleansing lotions, wipes and detergents. Triclocarban-containing products have been marketed broadly in the United States and Europe for more than 45 years; an estimated 1 million pounds of triclocarban are imported annually for the U.S. market.

The researchers found two key effects: In human cells in the laboratory, triclocarban increased gene expression that is normally regulated by testosterone. And when male rats were fed triclocarban, testosterone-dependent organs such as the prostate gland grew abnormally large.

Also, the authors said their discovery that triclocarban increased hormone effects was new. All previous studies of endocrine disruptors had found that they generally act by blocking or decreasing hormone effects.

"This finding may eventually lead to an explanation for some rises in some previously described reproductive problems that have been difficult to understand," said one author, Bill Lasley, a UC Davis expert on reproductive toxicology and professor emeritus of veterinary medicine. More analyses of antibacterials and endocrine effects are planned, he said.

Consumers should not take this study as guidance on whether to use triclocarban-containing products, Lasley said. "Our mothers taught us to wash our hands well before the advent of antimicrobial soaps, and that practice alone prevents the spread of disease."

The new study was published online by the journal Endocrinology ("Triclocarban enhances testosterone action: A new type of endocrine disruptor?") at: http://endo.endojournals.org/rep.shtml.

The nine authors are Lasley, Jiangang Chen, Ki Chang Ahn, Nancy Gee, Mohamed I. Mohamed, Antoni Duleba, Ling Zhao, Shirley Gee and Bruce Hammock. They are associated with these UC Davis programs: Center for Health and the Environment; Department of Entomology; California National Primate Research Center; Division...
Pesticide Exposure

The National Agriculture Health study was started in 1993 and is to continue through 2013. A recent survey of the 89,658 participants had some interesting information regarding exposure:

- 14% of pesticide applicators have had an acute exposure in their lifetime
- Applicators who wear chemical-resistant gloves reduce chronic exposures by 66 to 75 percent
- 37% take a shower or bath after applying pesticides
- 95% wear clean clothing the day after applying pesticides
- 78% take off their work boots before entering their home
- 74% laundry clothes worn applying pesticides separately
- 87% of the pesticides were not stored in the home

(Ag Health Study via North Dakota Pesticide Quarterly, January 2008)


PulseNet, FoodNet, NARMS; Tools to Fight Disease, Protect Public Health

Foodborne illness outbreaks are shifting from the typical point source, or “church supper,” outbreak to more diffuse outbreaks. These can occur over many communities, with only a few illnesses in each, and therefore are difficult for public health authorities to track.

The nature of outbreaks has changed because food production and distribution have changed. Until recently, the food supply system consisted of local growers and local or regional processors. More recently, large food-producing facilities, often with nationwide distribution, have replaced smaller, regional facilities. Public health experts have difficulty detecting and dealing with this relatively new style of dispersed outbreak.

The Food and Drug Administration’s Center for Veterinary Medicine, the Centers for Disease Control and Prevention (CDC), and the U.S. Department of Agriculture (USDA) are working in partnership to detect and combat the problems of this new type of outbreak.
These three government agencies have established federal food safety programs to improve their ability to identify and investigate outbreaks and take appropriate action. These programs, “PulseNet,” “FoodNet,” and “NARMS,” use new laboratory, research, statistical, and analytical tools to help protect public health.

To read about these programs link to: [FDA Veterinarian](#).


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**Veterinary Notes**

**FARAD Back Online**

FARAD is a computer-based decision support system designed to provide livestock producers, extension specialists, and veterinarians with practical information on how to avoid drug, pesticide and environmental contaminant residue problems. The drugs and pesticides used in modern animal agriculture improve animal health and thereby promote more efficient and humane production.

The FARAD Residue Hotline Telephone (1-888-USFARAD [888-873-2723]) is again operational.

Questions from Veterinarians to the FARAD Hotline can be submitted online now at www.farad.org.

Check out the [FARAD website](#) for more information.