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# Environmental Toxicology Newsletter

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**Extension Toxicologist**

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## Third National Report on Human Exposure to Environmental Chemicals

The *National Report on Human Exposure to Environmental Chemicals* provides an ongoing assessment of the U.S. population's exposure to environmental chemicals using biomonitoring. Biomonitoring is the assessment of human exposure to chemicals by measuring the chemicals or their metabolites in human specimens such as blood or urine.

This *Third Report* presents first-time exposure information for the U.S. population for 38 of the 148 chemicals included in the *Report*. The *Report* also includes the data from the Second Report; that is, data for 1999-2000.

**Executive Summary - Key Highlights and Findings**

**First-Time Exposure Information for the U.S. Population for 38 of the 148 Chemicals Included in the Report**
These 38 chemicals are pyrethroid insecticides; the organochlorine pesticides aldrin, endrin, and dieldrin; additional polycyclic aromatic hydrocarbons (including benzo-[a]-pyrene); additional phthalate metabolites; additional dioxins,

furans, and polychlorinated biphenyls; and additional pesticides and herbicides. As a result of measuring these chemicals, population "reference ranges" for blood and urine concentrations of the chemicals, including 95th percentiles, are available for the first time. The 95th percentile level means that 95% of the samples of serum, blood, or urine from the population have concentrations below that level. Public health officials use the reference ranges to determine whether groups of people are experiencing an exposure that is unusual compared with an exposure experienced by the rest of the population.

**Continued Progress in Reducing Blood Lead Levels in Children**

New data on blood lead levels in children aged 1 to 5 years enable estimates of the number of children with elevated levels (that is, levels greater than or equal to 10 µg/dL). For the period 1999-2002, 1.6% of children aged 1 to 5 years had elevated blood lead levels. This percentage has decreased from 4.4% in the early 1990s. These data document that public health efforts to reduce the number of children with elevated blood lead levels in the general population continue to be successful. However, other data show that special populations of children at high risk for lead exposure (for example, children living in homes containing lead-based paint or lead-contaminated dust) have higher rates of elevated blood lead levels and remain a major public health concern. Since no safe blood lead level in children has been identified, emphasis should be placed on efforts to control or eliminate lead in children's environment before children are exposed.

**Exposure to Environmental Tobacco Smoke**

Cotinine is a metabolite of nicotine, and levels of cotinine in blood track exposure to environmental tobacco smoke (ETS) in people who do not smoke. Higher cotinine levels indicate more exposure to ETS, which has been identified as a human carcinogen. Data on blood cotinine levels for the U.S. population are available for 1988-1991 from previous work at CDC. With this Third Report, data are now available for the period 1999-2002. Compared with results from the period 1988-1991, the 1999-2002 data show that median cotinine levels in nonsmokers have decreased 68% for children, 69% for adolescents, and about 75% for adults. Non-Hispanic blacks have levels more than twice those of Mexican Americans and non-Hispanic whites. Children's levels are more than twice those of adults. Efforts to reduce ETS exposure in the population show significant progress, but ETS exposure remains a major public health concern.

**Exposure to Cadmium**

Recent research studies have shown that urine cadmium levels as low as 1 µg per gram of creatinine in people may be associated with subtle kidney injury (that is, injury that may not be readily apparent) and with an increased risk for low bone-mineral density. CDC is not establishing a new level of health concern in this Report, but is noting how population urine cadmium levels compare with results of recent research. The Third Report shows that about 5% of the U.S. population aged 20 years and older had urinary cadmium levels at or near these levels. Cigarette smoking is the most likely source for these higher cadmium levels. These cadmium findings should promote further research on the public health consequences of cadmium in people.

**Encouraging Findings About Exposure to the Organochlorine Pesticides Aldrin, Endrin, and Dieldrin**

These three pesticides are similar and were once widely used insecticides in agricultural applications, particularly for cotton and corn. Agricultural uses of aldrin and dieldrin were discontinued in the United States in 1970, and termite control ended in 1987. Production and use of endrin was discontinued in 1986. Although these pesticides are no longer used in the United States, they are still used in other countries. Results from the Third Report show undetectable or very low serum levels of each of these organochlorine pesticides.

**Better Human Exposure Data for Dioxin-like Compounds**

The Third Report provides data for 29 dioxins, furans, and dioxin-like polychlorinated biphenyls that now have generally lower limits of detection than they did previously. Results for three of these chemicals are presented for the first time in this Report. The new exposure information for dioxins and related compounds will substantively improve risk assessments currently in progress to determine health risks to the U.S. population from exposure to this family of chemicals.

**Mercury Exposure Among Women of Childbearing Age (16-49 Years)**
Most of the mercury in blood comes from the consumption of fish or shellfish which accumulate methylmercury from water and soil. Mercury exposure is important to monitor in women of childbearing age because mercury can cause adverse neurodevelopmental effects in the developing fetus at blood levels potentially attainable through dietary sources. Data from the Third Report for the period 1999-2002 show that all women of childbearing age had levels below 58 µg per liter (µg/L), a concentration associated with neurodevelopmental effects in the fetus.

However, mercury levels in these women continue to merit close monitoring because 5.7% of women of childbearing age had levels within a factor of 10 of those associated with neurodevelopmental effects. Defining safe levels of mercury in blood continues to be an active research area.

REF: CDC 2005 http://www.cdc.gov/exposurereport/


## 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.

**Mississippi, 2002:** The 2002 West Nile virus (WNV) epidemic in Mississippi prompted an increase in MC activities, including application of ULV permethrin by truck-mounted foggers. Because of concerns about potential health effects from pesticides, the Mississippi Department of Health and CDC (Centers for Disease Control and Prevention) assessed whether MC activities increased individual urine pesticide metabolite concentrations. During September 8-19, 2002, investigators selected a geographically-random sample of 125 persons by using maps of two regions where public health officials applied MC pesticides and 67 persons from two control regions. Each participant completed a questionnaire describing home and occupational use of pesticides and provided a spot urine sample for analysis of pesticide metabolites 1-4 days after MC (i.e., within 5 half-lives). By using a cross-sectional design, investigators compared urine pesticide metabolite concentrations of exposed and unexposed study participants. Exposure to permethrin was verified by cross-referencing the global positioning systems location of participants with local MC spray routes. Permethrin was applied in MC regions at a concentration of 0.032 oz/acre.

Urine samples were analyzed at CDC by using tandem mass spectrometry. Urinary metabolite concentrations of 3-phenoxybenzoic acid (3pba), a metabolite of synthetic pyrethroid pesticides such as permethrin, did not differ significantly between MC and non-MC regions. Although **3pba concentrations did not differ between participants who used pesticides at home or at work and those who did not**, participants who used **pesticides on pets had significantly higher** mean 3pba concentrations than those who did not. These findings indicated that local MC activities **did not lead to increased pesticide metabolite concentrations in the urine of participants.**

**North Carolina, 2003**: Hurricane Isabel made landfall in North Carolina on September 18, 2003. Because of ensuing rains and flooding, mosquito populations were expected to surge. To control mosquitoes and prevent transmission of WNV and other arboviruses, the North Carolina Department of Environmental and Natural Resources (NCDENR) sprayed ULV naled and permethrin.

NCDENR and CDC conducted a prospective exposure assessment of ULV spraying of pesticides. Investigators recruited 90 persons from a random sample of census blocks (that accounted for the population density) marked for spraying. Participants then completed a pre-spray questionnaire about household and occupational exposure to pesticides and provided urine samples to quantify concentrations of pesticide metabolites. On September 30, aircraft in North Carolina sprayed ULV naled at 0.7 oz/acre. In addition, trucks sprayed ULV permethrin (Biomist 30+30®) at 0.0014 lbs/acre. Eighteen hours after aerial spraying (approximately one half-life), each participant completed a post-spray questionnaire about household and occupational exposure to pesticides and provided a second urine sample.

Of the 90 persons recruited to participate in this exposure assessment, 75 (83%) provided pre-spray and post-spray questionnaires and urine samples. The concentrations of all pre- and post-spray pesticide metabolites measured in participant urine samples were low. Dimethylphosphate (DMP), a metabolite of organophosphate pesticides such as naled, was detected in 46% of pre-spray and 49% of post-spray urine samples. The GM 3pba concentration from post-spray urine sampled was 0.2 $\mu$g/L. Generalized estimating equations (GEE) indicated **no statistically significant differences in the urine concentrations of naled and permethrin metabolites before and after spraying.** Participants who ate fresh fruits or vegetables $\leq$3 days before completing the pre-spray or post-spray questionnaires had significantly higher urine concentrations of dimethylthiophosphate than participants who did not pre-spray or post-spray. Two participants who worked on farms and/or handled pesticides had significantly higher urine concentrations of nonspecific organophosphorus pesticide metabolites (e.g., dimethyldithiophosphate, diethylthiophosphate, and diethylphosphate) than participants who did not work on farms or handle pesticides.

**Virginia, 2003**: To control mosquitoes and prevent transmission of arboviruses after Hurricane Isabel, the Virginia Department of Health (VDH) decided to spray ULV naled and d-phenothrin. VDH and CDC assessed exposure to ULV spraying of pesticides by randomly selecting 95 residents of high population-density census blocks marked for spraying. Participants then completed pre-spray questionnaires about household and occupational exposure to pesticides and provided urine samples to quantify concentrations of pesticide metabolites.

On September 30, aircraft sprayed ULV naled at 0.5 oz/acre while trucks sprayed ULV of d-phenothrin (Anvil 10+10®) at 0.0036 lbs/acre. Eighteen hours after spraying (approximately one half-life), each participant completed a post-spray questionnaire about household and occupational exposure to pesticides and provided a second urine sample.

Of the 95 persons recruited for the assessment, 83 (87%) provided pre-spray and post-spray exposure questionnaires and urine samples. The concentrations of all pesticide metabolites measured in participants' urine samples were low. DMP was detected in 42% of pre-spray and 48% of post-spray urine samples. The geometric mean 3pba concentration from post-spray urine samples was 0.6 $\mu$g/L. GEEs indicated **no overall difference in the urine concentrations of naled and d-phenothrin metabolites before and after spraying.**

**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 3pba 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 Weekly, June 3, 2005 / 54(21);529-532.


## Carbon Monoxide Poisoning from Hurricane-Associated Use of Portable Generators - Florida, 2004

The four major hurricanes that struck Florida during August 13-September 25, 2004, produced electric power outages in several million homes. After the hurricanes, the Consumer Product Safety Commission (CPSC) investigated six deaths in Florida attributed to carbon monoxide (CO) poisoning. The Florida Department of Health and CDC analyzed demographic and CO exposure data from these fatal poisoning cases and from nonfatal poisoning cases among 167 persons treated at 10 hospitals, including two with hyperbaric oxygen ($HBO_2$) chambers. This report describes the results of that analysis, which determined that misplacement of portable, gasoline-powered generators (e.g., indoors, in garages, or outdoors near windows) was responsible for nearly all of these CO exposures. Public health practitioners should recognize that post-hurricane environments present challenges to the safe operation of portable generators and

should educate the public on the hazards of CO poisoning in these settings.

**Editorial Note:** Portable, gasoline-powered generators are a common source of unintentional CO poisoning after power outages. The devices are used increasingly to provide electricity during temporary outages resulting from adverse weather events, but the CO produced during their operation can be a serious health hazard. The exhaust produced by the typical 5.5 kW generator contains as much CO as that of six idling automobiles. When used indoors or in close proximity to residential dwellings, this exhaust can quickly infiltrate living spaces and incapacitate occupants.

REF: MMWR, July 22, 2005 / 54(28);697-700


## Mercury Exposure - Kentucky, 2004

In November 2004, a student aged 15 years brought a small vial of liquid mercury onto a school bus and into a high school in Kentucky. A subsequent investigation revealed that mercury had been in the student's possession for more than a year and that substantial amounts had been spilled in multiple locations. This report describes the results of that investigation, which indicated that 1) duration of exposure was associated with the amount of mercury absorbed by exposed persons and 2) extensive multiagency collaboration facilitated an efficient response. The investigation further revealed that, although mercury exposure is common, clinicians might not be aware of how to evaluate and treat patients with mercury exposure. State and federal health agencies should provide schools, clinicians, and local health department staff with readily accessible guidelines for use in mercury spills and exposures.

On November 10, school officials at a county high school in rural Kentucky discovered approximately 15 students playing with liquid mercury in the school cafeteria. School officials separated the students, confiscated and bagged their clothes, and closed the cafeteria. Local health department and environmental protection officials were notified. Questioning revealed that a boy aged 15 years had brought a vial of mercury to school on a school bus. Parents were advised to consult their health-care providers about whether their child should be tested for mercury exposure. Several children were tested at the local hospital, but none had concentrations exceeding background levels other than the student who brought the mercury to the school.

During November 10-24, local and state health department staff coordinated a public health investigation of the mercury exposure, and the U.S. Environmental Protection Agency (EPA) conducted an environmental investigation. Law enforcement and health department staff interviewed relevant observers and persons who directly handled the mercury. Serum and 24-hour urine mercury samples (measured in micrograms per liter [$\mu$g/L]) were collected for all persons who reported substantial exposure (i.e., persons who were known to have handled the mercury on multiple occasions or who spent 1 hour or more in rooms or vehicles during periods in which those places were known to be contaminated) and were tested at a local hospital. EPA and Kentucky Department for Environmental Protection (KDEP) personnel collected environmental air samples (measured in nanograms per cubic meter [ng/m$^3$]) at implicated locations and conducted ongoing cleaning and environmental assessment until ambient mercury levels were brought within acceptable limits (i.e., <3,000 ng/m$^3$) or the site was deemed unrecoverable.

EPA and KDEP officials assessed the student's school and home environments and initiated cleanup procedures. The school cafeteria contained mercury levels ranging from 5,280 ng/m$^3$ to 36,600 ng/m$^3$. The school was closed by the

school superintendent to limit the potential for exposure of children and to facilitate cleaning of the cafeteria. After 2 days of cleanup, heating, and venting, EPA deemed the school safe for students to return.

Approximately 15 school buses were also tested and/or cleaned. The family's mobile home and possessions were deemed unrecoverable (ambient mercury was >50,000 ng/$m^3$ at outset of investigation and later reduced to 11,550 ng/$m^3$) and were removed and destroyed. The family van (14,950 ng/$m^3$ reduced to 1,285 ng/$m^3$) and an additional vehicle (>50,000 ng/$m^3$ reduced to 174 ng/$m^3$) were eventually cleaned and returned to the family. However, a third vehicle (41,275 ng/$m^3$ reduced to 36,610 ng/$m^3$), belonging to the family of a friend of the student, was determined unrecoverable and removed by EPA.

During the cleanup process, more liquid mercury was collected than could be contained in the vial that the student had carried to school. The student claimed that he had found the mercury in the trash of a dentist's office during a visit on November 9. Investigation revealed that the mercury was kept in a storage area at the dentist's office that doubled as a restroom for patients. Examination of dental office records indicated that the student had visited the dentist on August 29, 1997, August 21, 2003, and November 9, 2004. Additional evidence suggested that the student had mercury for several months before the school exposure. Under further questioning, the student admitted having obtained the mercury during a previous visit to the dentist (presumably the August 2003 visit). Investigators suspected that the student took mercury during each of the last two visits, accounting for the excess mercury recovered in the cleanup process. EPA personnel disposed of all remaining mercury in the dentist's office.

Nine family members, including the student, had lived in the mobile home during different periods preceding the incident. In addition, the student's friend and his family, including a pregnant female, indicated that they had spent considerable time in one of the contaminated vehicles. Moreover, an additional 12 persons were said to have spent substantial amounts of time in the mobile home.

Blood concentrations were obtained for the student and seven family members who were living in the mobile home. Blood mercury levels ranged from 32 $\mu$g/L to 72 $\mu$g/L (normal: 0-10 $\mu$g/L). The 24-hour urine mercury concentrations obtained from seven of these patients ranged from 28 $\mu$g/L to 496 $\mu$g/L (normal: 0-19 $\mu$g/L). The student had the highest mercury levels for both blood and urine (i.e., 72 $\mu$g/L blood and 496 $\mu$g/L for initial urine concentration). Urine mercury concentrations were directly associated with amount of time spent in the mobile home. Three of the children, including the student, lived in the contaminated home for 15 months and had urinary concentrations ranging from 193 $\mu$g/L to 496 $\mu$g/L, whereas three of the children who lived in the home for only 10 weeks had urinary concentrations ranging from 28 $\mu$g/L to 68 $\mu$g/L. The additional family member, a woman who had not been in the mobile home since June 2004, had a urine mercury concentration of 241 $\mu$g/L. Three additional persons, who were exposed to the contaminated vehicle that had to be destroyed, had urinary mercury levels ranging from 4 $\mu$g/L to 8 $\mu$g/L. An infant born to one of these persons in May 2004 had no signs of mercury exposure. Five family members, including the student responsible for the initial exposure, were chelated by using succimer. The three adolescent family members with the longest exposures received chelation in multiple sessions. Final urine mercury levels were 48, 44, and 35 $\mu$g/L, for the student and the two other children, respectively.

Several of the children living in the mobile home experienced itchy rashes and headaches. In late 2003, one girl aged 13 years residing in the mobile home had experienced several months of illness consistent with mercury exposure (e.g., unexplained tachycardia, hypertension, desquamation of soles and palms, rashes, diaphoresis, muscle pain, insomnia, vomiting, and behavioral and psychiatric changes). She was hospitalized for approximately 30 days. Mercury toxicity was not considered at the time, so testing was not performed. The patient improved with a cardiac stent concurrent with removal from the exposure setting.

**Editorial Note:** Mercury spills and exposures are common. In EPA Region 4, a total of 40 documented mercury spills

occurred during September 1, 1999-March 23, 2005, with 14 of those spills occurring in fiscal year 2005. Kentucky experienced 15 spills during that period, 10 of which were associated with schools and five with residences only.

During this investigation, a strong association was observed between the duration of exposure and remaining levels of mercury in patients. Compared with three children who had recent exposures of 10 weeks' duration, a woman who had been exposed for 8-10 months but left that setting approximately 5 months before the November incident had substantially higher levels of mercury, as evidenced by high urine concentrations. Children exposed for 15 months in the mobile home had substantially higher levels than those who had only 10 weeks' exposure. Only those children who experienced the 15-month exposure were recommended for chelation. Finally, although the family acquaintances were exposed to high levels of mercury (i.e., in their contaminated vehicle), their exposures were periodic and brief, which might have resulted in limited mercury levels.

The mercury exposures described in this report, which occurred in multiple locations and resulted in extensive property loss and intensive cleanup efforts, highlight the utility of multiagency collaboration in investigations. Collaboration of local, state, private, and federal officials improved the response time and investigation outcome. This coordination is essential to mount a public health response to exposures such as this, which quickly outstrip local resources.

REF: MMWR, August 19, 2005 / 54(32);797-799


# TOXICOLOGY TIDBITS

## Can I Eat That?

***True or false: You can leave coffee in the pot and drink it the next day?***

**True.** Coffee will eventually grow surface mold but usually not in one day, says Donald W. Schaffner, Ph.D., extension specialist in food science and professor at Rutgers, The State University of New Jersey. But even though it's drinkable, it won't taste as fresh because the compounds that form coffee's characteristic aroma and flavor are volatile, meaning they will evaporate at room temperature and be lost, says Purnendu C. Vasavada, Ph.D., a professor of food science and microbiology at the University of Wisconsin-River Falls. Refrigerating the coffee will help keep its flavor fresher the next day.

***True or false: You don't really need to refrigerate eggs -- Europeans don't.***

**False.** Well, it's partially true. Europeans traditionally don't refrigerate eggs, and we didn't always have mandatory refrigeration of eggs, either. "However, the United States now requires refrigeration because we know that salmonella can sometimes (very rarely -- 1 in 10,000 or 20,000 eggs) be present. If the eggs were not refrigerated, salmonella would be able to multiply to very high levels [in those rare situations]," says Schaffner.

***True or false: Pizza that's been left out overnight is perfectly safe.***

**True and false.** From a taste perspective, it's just fine; some people actually prefer it. However, "From a public health perspective, you shouldn't eat pizza left out for more than a few hours -- it could potentially be hazardous," says Schaffner. On the other hand, not too many people have become sick from eating pizza that sat out all night. When pizza comes out of the oven, almost all the pathogens are inactive. And between the acidic tomato sauce (not hospitable to bacteria) and the pasteurized cheese, as well as the fact that all cheese was designed to last without refrigeration, it's probably safe from a practical standpoint. However, Schaffner cautions that if the pizza has sausage, pepperoni or other types of meat, the risk increases -- he suggests tossing it.

REF: FSnet Aug. 4/05

## Annual Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses - United States, 1997-2001

Smoking harms nearly every organ of the body, causing many diseases and reducing quality of life and life expectancy. This report assesses the health consequences and productivity losses attributable to smoking in the United States during 1997-2001. CDC calculated national estimates of annual smoking-attributable mortality (SAM), years of potential life lost (YPLL) for adults and infants, and productivity losses for adults. The findings indicated that, during 1997-2001, cigarette smoking and exposure to tobacco smoke resulted in approximately **438,000 premature deaths in the United States**, **5.5 million YPLL**, and **$92 billion in productivity losses annually**. Implementation of comprehensive tobacco-control programs as recommended by CDC can reduce smoking prevalence and related mortality and health-care costs.

REF: MMWR, July 1, 2005.

## ADA Updates Fluoridation Booklet

The American Dental Association has expanded and updated its "Fluoridation Facts" booklet, which can be read online free of charge http://www.ada.org/public/topics/fluoride/facts/fluoridation_facts.pdf .

REF: ADA website

## Real Mercury Facts

The University of Maryland's newly formed Center for Food, Nutrition, and Agriculture Policy (CFNAP) has launched **www.realmercuryfacts.org**. The website is the outgrowth of a national survey, documenting extensive public confusion about mercury levels in seafood and a growing knowledge gap about which species of fish are high or low in mercury. Conducted for the University of Maryland by Opinion Research Corporation, the poll finds that almost one-third of the public (31%) reports being concerned about the amount of mercury in fish and shellfish and as a result, many consumers are cutting back on the amount of seafood they eat.

REF: FPA Daily Update, October 17, 2005

## Dairy Cows Act as Biofilters for Perchlorate

Dairy cows may metabolize over 80% of ingested perchlorate in their digestive system, reducing the amount of this chemical that can be transferred to milk. Public concern about the environmental presence of perchlorate, a naturally occurring and industrially used compound, has increased in recent years. Perchlorate is potentially dangerous because it competes for iodine uptake in the thyroid gland and may subsequently reduce thyroid hormone levels, which are necessary for growth and development. Lactating mammary glands can also take up iodine, raising concerns that ingested perchlorate might be transferred to milk. Anthony Capuco and colleagues evaluated the effects of perchlorate on the health and milk of 16 dairy cows. The researchers infused perchlorate into the cows' digestive tracts and found that while perchlorate levels increased slightly in the milk (and urine, feces, and blood) as its administration increased, the rise was not linear. At the highest infusion level (40 mg/d), perchlorate output was only 17% of total input, which the researchers believe is due to perchlorate being metabolized to chloride in the bovine rumen. Extra perchlorate did not accumulate in animal tissue, and no reduction in thyroid hormones or other negative health effects were observed.

REF: IFT Daily November 3, 2005 (Institute of Food Technologists)

## Toxicological Profile for Perchlorates

Perchlorates are colorless salts that have no odor. Five perchlorates are manufactured in large amounts; magnesium perchlorate, potassium perchlorate, ammonium perchlorate, sodium perchlorate, and lithium perchlorate. Perchlorates are found in the environment in two forms. If no water is present, as in a drum or on top of dry ground, then they will

exist as solids. If water is present, then they will quickly dissolve. When perchlorates dissolve, they separate into two parts. One part has a positive charge, and the other part has a negative charge. The part with the negative charge is called the perchlorate anion or just perchlorate. This is the part of the chemical that people look for in the environment or in your body.

This and other information about Perchlorates can be found at: http://www.atsdr.cdc.gov/toxprofiles/tp162.html

## Warning on Liqiang 4 Dietary Supplements

The FDA is warning consumers not to take Liqiang 4 Dietary Supplement Capsules because they contain glyburide, a drug that could have serious, life-threatening consequences for some people. Liqiang 4 has also been called Liqiang Xiao Ke Ling--Liqiang Thirst Quenching Efficacious--in ads in Chinese language publications. The ads promote the substance as being derived from only natural ingredients and as being useful for controlling diabetes.

Glyburide, a drug used to lower blood sugar, is safe and effective when used as labeled in FDA-approved medications. But people who have low blood sugar or those with diabetes can receive dangerously high amounts of glyburide by consuming Liqiang 4. Consumers should immediately stop using this product and seek medical attention, especially if they are being treated with diabetes drugs or if they have symptoms of fatigue, excessive hunger, profuse sweating, or numbness of the extremities. Consumers who have this product should dispose of it immediately.

The FDA learned of the potential problem through an anonymous consumer complaint, and followed up with testing that revealed the presence of glyburide in Liqiang 4. The product is sold as part of a shrink-wrapped two-bottle set. One of the 90-capsule bottles is labeled Liqiang 4 Dietary Supplement Capsules, and the other bottle is promoted as a "bonus pack" of Liqiang 1. The FDA is evaluating Liqiang 1 and other versions of this line of products to determine their composition and safety.

The product is manufactured by Liqiang Research Institute, China, and marketed throughout the United States in herbal stores and through mail order by Bugle International of Northridge, Calif.

The FDA encourages consumers, health professionals, and caregivers to report adverse events related to this product to MedWatch, the agency's voluntary reporting program. Phone: (800) FDA-1088; Fax: (800) FDA-0178; Online: www.fda.gov/medwatch/report.htm; or Mail: MedWatch, FDA, 5600 Fishers Lane, Rockville, MD 20857-9787.

REF: FDA Consumer Magazine, September/October 2005

## Safe Cider and Juice

The FDA is reminding consumers about the risks of drinking juice and cider that has not been treated through pasteurization or other means to ensure its safety. When fruits and vegetables are made into juice, harmful bacteria which may be present on the produce can become part of the juice. Unless the juice is pasteurized or otherwise treated, the bacteria may cause serious and even fatal illness in consumers. Young children, the elderly and persons with weakened immune systems have the highest risk of contracting illness. Parents, school officials, and children's activity leaders need to be aware of this.

When purchasing juice in a store it is easy to tell if it has been treated for safety. Untreated packaged juice products are required to bear the following label: **WARNING: This product has not been pasteurized and, therefore, may contain harmful bacteria that can cause serious illness in children, the elderly, and persons with weakened immune systems.** However, not all juice comes from a retail store. School officials and others often take children to farms and orchards for fall activities. Untreated cider may be served by the glass at these activities. No warning signs or labels are required for juice served by the glass. Therefore, FDA recommends that, when you plan such activities, you ask if untreated juice or cider is served at the location, and if it is avoid giving it to children. Fruit and vegetable juices and cider are nutritious, healthful beverages as long as they are pasteurized or otherwise treated to kill harmful bacteria. By following these recommendations, fall activities can be safe as well as fun.

REF: FDA Consumer Magazine, September/October 2005

## Malathion Risk Assessment

EPA is working on malathion's risk assessment. EPA has revised its human health risk assessment. One of the potential risk concerns is for adults and children who may be exposed to malathion per se from the **home fogger use** of malathion. EPA is also concerned about the pharmaceutical use of malathion (head lice).

EPA is seeking information on actual use data for all uses of malathion and other pesticides. Since, USDA-CSREES stopped its support for land grant universities collecting such data, EPA has no such data. (Federal Register, September 23, 2005)

REF: Pesticide Reports, October 2005.

## Study suggests that "ephedra-free" diet pills are not risk-free

Researchers at the University of California - San Francisco have found that two weight-loss supplements promoted as ephedra-free and safe for dieters caused increased heart rate among healthy people, and could have harmful health effects in some people. The research examined the effects on blood pressure and heart rate of two dietary products containing bitter orange extract-a substance that has replaced ephedra in many weight-loss products since the FDA banned it because of concerns about serious health effects. The study involved 10 healthy adults given Advantra Z, Xenadrine EFX, or a placebo. Single doses of both products increased heart rate by an average of 11 to 16 beats per

minute over baseline, which would be the equivalent of an 18% increase if the baseline rate is 80 beats per minute. In addition, Xenadrine EFX, which contains caffeine in addition to bitter orange, significantly increased blood pressure by 7 to 12% (9-10 mm Hg). The researchers concluded that the cardiovascular stimulant actions of Xenadrine EFX appear to be similar to banned ephedra products. (Haller CA and others. Hemodynamic effects of ephedra-free weight-loss supplements in humans. *American Journal of Medicine* 118:998-1003, 2005)

REF: Broadcast Digest, September 29, 2005.

## Pesticide Enforcement Gets Tougher for Good Reason

The Kern County District Attorney recently filed a civil complaint seeking $105,000 for a pesticide incident in May that injured more than two dozen vineyard workers near Arvin. But the major story behind that case -- and others around the state -- is yet to be told.

Late last year, criminal charges were filed against Golden West Nut Co., with operations in San Joaquin and Stanislaus County. The case involves misuse of the fumigant methyl bromide and a life-threatening injury to an employee. Criminal charges are unusual, to be sure. But this case went beyond carelessness. The prosecution charges that a defendant deliberately sought to cover up the injury caused by the company's negligence.That's why the Stanislaus County Agricultural Commissioner referred the case to a district attorney. In addition to jail time, the commissioner says that up to $500,000 in fines will be sought.

Other pesticide cases have received little or no publicity, but they are significant in terms of making statewide pesticide enforcement stronger and more consistent.

To read this entire article link to: http://www.cdpr.ca.gov/

REF: Department of Pesticide Regulation News, October 3, 2005.

## Chew On This

If you think you're having a heart attack, you're supposed to take an aspirin right away. A dose of 325 milligrams will do. Aspirin keeps platelets from clumping. And that should help keep the blood clot (or clots) in your coronary arteries -- which is what triggers the heart attack -- from getting any bigger and further depriving your heart of the blood it needs.

Time is of the essence, and chewing the aspirin tablet will get the anti-sticky-platelet action going faster. Needless to say, you shouldn't take coated aspirin, which is designed to bypass the stomach and be absorbed in the intestine.

But the advice to "chew then swallow" only applies in emergencies. A report published in 2004 in the *Journal of the*

*American Dental Association* described the consequences of routine aspirin chewing for two patients with jaw problems (temporomandibular pain) and overly sensitive teeth. They chewed four to eight aspirins a day for two years, seriously damaging the enamel and dentin of their teeth. Obviously these were extreme cases, but the lesson learned is that regularly chewing aspirin is bad for your teeth.

REF: Harvard Health Letter, September 2005

## Pesticde Fate Database

The EPA is making available on the web a database that provides information about what happens to pesticides after they are used in the environment. The database contains summary information on the physical and chemical properties and the environmental fate and transport of pesticides found in products registered in the United States. It also contains information on the degradates, or breakdown products, of these registered pesticides. Using a query-based system, the Pesticide Fate Database allows users to search, sort, and retrieve up-to-date pesticide fate and chemistry information derived from studies submitted by pesticide manufacturers in support of the registration/reregistration of their pesticide products. Some of the important information about pesticides in the current database include: basic physical and chemical properties, biotic and abiotic degradation half-lives in soil and water, adsorption/desorption constants, and bioconcentration factors in fish. For non-agricultural chemicals such as antifoulants and wood preservatives, the availability of the chemicals in water and leaching data are also included. This information about pesticides can be used for assessing pesticide exposure for ecological risk assessments and drinking water exposure assessments. The database is currently populated with about 188 pesticide active ingredients and will be expanded to include more chemicals in the future. The Pesticide Fate Database and instructions for using this database can be found at the following address: http://cfpub.epa.gov/pfate/index.cfm (EPA OPP *Update*, 8/19/05).

REF: Chemically Speaking, September 2005.

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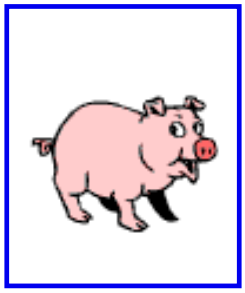

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