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CDC Releases Most Extensive Assessment Ever of Americans' Exposure to Environmental Chemicals

The Centers for Disease Control and Prevention (CDC) has released the second National Report on Human Exposure to Environmental Chemicals, the largest and most extensive assessment of the U.S. population's exposure to environmental chemicals. The report presents exposure information for 116 environmental chemicals measured in blood and urine specimens. The blood and urine specimens came from a sample of people who represent the U.S. population for the years 1999 and 2000.

"This report is by far the most extensive assessment ever of exposure of the U.S. population to environmental chemicals," said CDC Director Dr. Julie Gerberding, "This kind of exposure information is essential, it helps us to lay the critical groundwork for future research in ensuring that exposures to chemicals in our environment are not at levels that affect our health."

The report contains new data on declines in blood lead levels in children; decreases in adults' exposure to environmental tobacco smoke, and for the first time, extensive data on many other chemicals that will help public health physicians and scientists identify and prevent health problems from exposure.

Blood and urine samples were collected from some 2,500 participants for each chemical tested in CDC's National Health and Nutrition Examination Survey (NHANES)—an ongoing national health survey of the U.S. population. CDC's Environmental Health Laboratory developed special analytical methods and measured the chemicals and their metabolites (breakdown products) in these blood and urine samples.

Selected Findings -- Some Progress, Some Concern

Lead

New data on blood lead levels in children aged 1-5 years allow us to estimate the number of children with elevated levels. For 1999-2000, 2.2 percent (95 percent confidence interval of 1.0 to 4.3 percent) of children aged 1-5 years had elevated blood lead levels (levels greater than or equal to 10 micrograms per deciliter). This percentage has decreased from 4.4 percent for the period 1991-1994. "The continued decline of elevated blood lead levels in America's children is a public health success story. However, exposure of children to lead in homes containing lead-based paint and lead-contaminated dust remains a serious public health concern," said Dr. Richard Jackson, Director, National Center for Environmental Health.

Exposure to environmental tobacco smoke

Compared with levels measured during the period 1991-1994 for nonsmokers, cotinine levels have decreased 58 percent for children, 55 percent for adolescents, and 75 percent for adults. These declines support the effectiveness of public health efforts to reduce environmental tobacco smoke (ETS) exposure during the 1990s, which have mostly targeted adults," Dr. Jackson said. "However, continued efforts to reduce exposure to environmental tobacco smoke are warranted, especially for children, adolescents, and non-Hispanic blacks."

The second report presents extensive data for many other chemicals that include mercury, uranium, cadmium, thallium, and other metals; phthalates; organochlorine pesticides, herbicides, polycyclic aromatic hydrocarbons; carbamate insecticides; organophosphate pesticides, phytoestrogens. The report and an executive summary are available online at the following web site: http://www.cdc.gov/exposurereport. The report will continue to be released every two years, expanding the number of chemicals covered, providing physicians with reference levels of exposure so that they can recognize unusually high levels of exposure in patients and assessing the effectiveness of efforts to reduce chemical exposure.

REF: January 31, 2003, CDC, Media Relations: http://www.cdc.gov/od/oc/media/pressrel/r030131.htm

Pesticide Data Program
Annual Summary, Calendar Year 2001

Executive Summary

The Pesticide Data Program (PDP) was initiated by USDA in May 1991 to collect data on pesticide residues in foods. This publication summarizes PDP results for 2001. PDP results are released annually in a calendar-year summary in both hard copy and on the Internet.

PDP data are used by the Environmental Protection Agency (EPA), the Food and Drug Administration, the USDA Economic Research Service and Foreign Agricultural Service, as well as groups within the private sector. EPA uses PDP data to prepare realistic pesticide dietary exposure assessments as part of its ongoing effort to implement the 1996 Food Quality Protection Act. PDP data also are used by the Government and agricultural community to examine pesticide residue issues which may affect agricultural practices and U.S. trade. PDP data have been helpful in identifying crops where alternative pest management practices are needed. PDP data are also useful in promoting export of U.S. commodities in a competitive global market and addressing food safety issues.

Program operations are carried out with the support of 10 States: California, Colorado, Florida, Maryland, Michigan, New York, Ohio, Texas, Washington, and Wisconsin. Federal laboratories providing testing services include the AMS National Science Laboratory (formerly known as the AMS Eastern Laboratory), the Grain Inspection, Packers and Stockyards Administration (GIPSA) Laboratory, and, through December 2001, the National Monitoring and Residue Laboratory of the USDA Animal and Plant Health Inspection Service (APHIS). The USDA Food Safety and Inspection Service (FSIS) provided sample collection services for beef and poultry. The United States Geological Survey (USGS) worked with PDP in developing the water program and collected samples early in 2001. Later in the year, the participating water utilities provided the drinking water samples. The AMS Monitoring Programs Office is responsible for administrative, sampling, technical, and database activities.

PDP food sampling is based on a rigorous statistical design that ensures that the data are reliable for use in exposure assessments and 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. Samples collected by each of the 10 participating States are apportioned according to that State’s population. Samples are taken close to the time and point of consumption. They are randomly chosen and reflect what is typically available to the consumer throughout the year. Samples are selected without regard for commodity origin. 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 and sample collection is limited to the season when the commodity is available.

The PDP pilot program to test finished drinking water was initiated in New York and California – two highly populated regions with divergent climates and hydrogeological conditions. PDP data on pesticide residues in drinking water will be valuable for exposure assessments which, because of limited data, have generally used assumptions or models to predict residue levels.

In 2001, in addition to drinking water, PDP tested fresh and processed fruits and vegetables, rice, and beef and poultry tissues for various insecticides, herbicides, fungicides, and growth regulators. Of the 12,264 samples collected and analyzed, 9,903 were fruit and vegetable commodities including canned sweet peas, canned sweet corn, and tomato paste, as well as fresh apples, bananas, broccoli, carrots, celery, cherries, grapes, green beans, lettuce, mushrooms, nectarines, oranges, peaches, pineapples, and potatoes. PDP also tested 689 rice samples, 911 beef samples, 464 poultry samples, and 297 drinking water samples.

Approximately 82 percent of all samples were domestic and 17 percent were imported (less than 1 percent was of unknown origin). Bananas, grapes, green beans, peaches, and pineapples accounted for most of the imported commodities. All cherries and nectarines were domestic.

Approximately 64 percent of the fruit and vegetable samples (domestic and imported), 49 percent of drinking water samples, and 19 percent of the beef tissue samples had detectable residues. Residues detected in beef samples resulted almost entirely from low level detections of persistent chemicals that have been canceled for agricultural use for many years. There were no detectable residues in the poultry samples.

Overall, approximately 44 percent of all samples contained no detectable residues, 24 percent contained 1 residue, and 32 percent contained more than 1 residue. Fewer residues were detected in processed products and rice than in fresh commodities. No detectable residues were found in any of the canned sweet pea samples. Residues were detected in only two samples of canned sweet corn. Seventy percent of tomato paste samples and 69 percent of rice samples had no detectable residues. Low levels of environmental contaminants were detected in broccoli, carrots, lettuce, potatoes, and beef adipose. However, the concentrations detected were 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.

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 (CFR), Title 40, Part 180. In 2001, PDP testing found residues exceeding an established tolerance in 0.1 percent of the 12,264 samples. Residues with no established tolerance were found in 1.8 percent of all samples. These residues were detected at very low concentrations and are likely due to spray drift or crop rotations or could result from use of registered disinfectants and sanitizers used in food handling establishments. PDP reports these findings to FDA as they are reported by testing laboratories.

PDP laboratories maintain an ongoing verification of limits of detection (LODs) for each compound screened. These data are used by EPA to calculate possible exposure contributed by samples reported as “non-detects,” or not containing a residue above a stated LOD.

PDP continuously strives to improve methods for the collection, testing, and reporting of data. PDP data are available to EPA and other Federal and State agencies charged with regulating and setting policies on the use of pesticides.

Copies of this summary report may be obtained by calling the Monitoring Programs Office at (703) 330-2300 or by mailing the form provided at the end of this report. This report is also available on the PDP web site at

http://www.ams.usda.gov/science/pdp.

REF: USDA Agricultural Marketing Service website, February 2003.

Fatal Degenerative Neurologic Illnesses in Men Who Participated in Wild Game Feasts - Wisconsin, 2002

Creutzfeldt-Jakob disease (CJD) is a fatal neurologic disorder in humans. CJD is one of a group of conditions known as transmissible spongiform encephalopathies (TSEs), or prion diseases, that are believed to be caused by abnormally configured, host-encoded prion proteins that accumulate in the central nervous tissue. CJD has an annual incidence of approximately 1 case per million population in the United States and occurs in three forms: sporadic, genetically determined, and acquired by infection. In the latter form, the incubation period is measured typically in years. Recent evidence that prion infection can cross the species barrier between humans and cattle has raised increasing public health concerns about the possible transmission to humans of a TSE among deer and elk known as chronic wasting disease (CWD). During 1993-1999, three men who participated in wild game feasts in northern Wisconsin died of degenerative neurologic illnesses. This report documents the investigation of these deaths, which was initiated in August 2002 and which confirmed the death of only one person from CJD. Although no association between CWD and CJD was found, continued surveillance of both diseases remains important to assess the possible risk for CWD transmission to humans.

Case Reports

Case 1. In December 1992, a Wisconsin man aged 66 years with a history of seizures since 1969 sought treatment for recurring seizures, increasing forgetfulness, and worsening hand tremors. In February 1993, he was hospitalized for increasing confusion, ataxia, and movement tremors of his extremities. A diagnosis of CJD was suspected. The man died later that month; neuropathologic examination of brain tissue during autopsy indicated subacute spongiform encephalopathy, compatible with CJD.

The man was a lifelong hunter who ate venison frequently. He hunted primarily in northern Wisconsin but also at least once in Montana. He hosted wild game feasts at his cabin in northern Wisconsin from 1976 until shortly before his death. Fixed brain tissue obtained during the autopsy was sent for analysis to the National Prion Disease Pathology Surveillance Center (NPDPSC) and reexamined at the institution where the autopsy was conducted. Histopathologic examination did not substantiate the diagnosis of prion disease. In addition, 27 brain tissue sections were negative for prions by immunostaining despite positive antibody reactions against other proteins (controls), which indicated that other epitopes in the tissue samples were preserved.

Case 2. In May 1999, a Minnesota man aged 55 years with no previous history of a neurologic disease sought evaluation and treatment following a 3-month history of progressive difficulty in writing and unsteadiness of gait. A computerized tomography (CT) scan and MRI examination of his head did not indicate any abnormality. In June 1999, he was hospitalized following onset of dementia, speech abnormalities, and myoclonic jerking. An EEG indicated left-hemispheric periodic sharp waves and moderate generalized background slowing; CJD was diagnosed clinically. In July 1999, following worsening symptoms and development of right upper extremity dystonia, the patient died. Neuropathologic evaluation of brain tissue during autopsy demonstrated widespread subcortical spongiform lesions,

consistent with CJD.

The man was not a hunter but had a history of eating venison. He made an estimated 12 visits to the cabin where the wild game feasts were held, but he participated in only one feast during the mid-1980s. Prion disease was confirmed by immunohistochemical and Western blot testing. The Western blot characteristics and prion disease phenotype in this patient were consistent with the most common form of sporadic CJD, classified as M/M (M/V) 1. Subsequent genetic typing confirmed the presence of methionine homozygosity (M/M) at codon 129 of the patient's prion protein gene.

Case 3. In June 1992, a Wisconsin man aged 65 years sought treatment for progressive slowing of speech, worsening memory, and personality changes. By January 1993, his speech was reduced to one-word utterances. Pick's disease was diagnosed. By May, he was unable to perform any daily living activities; he died in August 1993. Neuropathologic evaluation of brain tissue during autopsy showed symmetrical frontal lobe cerebral cortical atrophy and mild temporal lobe atrophy. No Pick's bodies or spongiform lesions were observed.

The man had a history of eating venison and participated regularly in wild game feasts held at the cabin owned by patient 1. He was a lifelong hunter and hunted mostly in Wisconsin but also in Wyoming and British Columbia. No game was brought to the wild game feasts from his hunting trips outside of Wisconsin. Examination of fixed brain tissue sent to NPDPSC demonstrated no lesions indicative of CJD, and immunohistochemical testing with antibody to the prion protein did not demonstrate the granular deposits seen in prion diseases.

Epidemiologic Investigation

Wild game feasts consisting of elk, deer, antelope, and other game that occurred at a cabin in northern Wisconsin owned by patient 1 began in 1976 and continued through 2002. These feasts typically involved 10-15 participants and usually occurred on weekends before or during hunting seasons in the fall and occasionally in the spring. Wild game brought to these feasts usually were harvested in Wisconsin, but three men who attended these feasts reported hunting in the western United States and bringing game back to Wisconsin. These activities took place in Colorado (near the towns of Cortez, Trinidad, Collbran, Durango, and Meeker), Wyoming (near the towns of Gilette and Cody), and Montana (near the town of Malta). CWD was not known to be endemic in these areas at the time that these hunting activities took place.

Information was obtained for 45 (85%) of 53 persons who were identified as possibly participating in the wild game feasts; all were male. Information was obtained by direct interview or from family members of decedents. Of the 45 persons, for whom information was obtained, 34 were reported to have attended wild game feasts. Seven of the 34 feast attendees were deceased, including the three patients. None of the four other decedents had a cause of death attributed to or associated with a degenerative neurologic disorder. None of the living participants had any signs or symptoms consistent with a degenerative neurologic disorder.

Editorial Note: CWD was first described in the United States in the 1960s and classified as a TSE in 1978. Previously localized to a contiguous endemic area in northeastern Colorado and southeast Wyoming, since 2000, CWD has been found in free-ranging deer or elk in Illinois, Nebraska, New Mexico, South Dakota, Wisconsin, and outside the previously known endemic areas of Colorado and Wyoming. CWD has been identified also in captive deer or elk in Colorado, Kansas, Minnesota, Montana, Nebraska, Oklahoma, South Dakota, and Wisconsin. Because a variant form of CJD, with specific neuropathologic and molecular characteristics that distinguish it from sporadic CJD, has been associated with eating cattle products infected with a prion that causes bovine spongiform encephalopathy, concern has been raised about the possibility that the prion associated with CWD might be transmitted to humans in a similar way.

In this investigation, because only one of the three cases in Wisconsin had neuropathologic confirmation of a prion disease, no association could be made between case participation in the wild game feasts and the development of CJD. Although patient 2 had confirmed CJD, he was unlikely to have eaten CWD-infected venison at these feasts because venison and other game from outside Wisconsin that was served at these feasts did not originate from known CWD-

endemic areas, and the man participated in the feasts only once. In addition, the prion disease in this case was consistent with the most common form of sporadic CJD, without apparent unusual neuropathologic or molecular characteristics that might occur if the prion related to CWD had been responsible for the disease.

A previous investigation of unusually young CJD patients in whom the transmission of CWD was suspected also did not provide convincing evidence for a causal relationship between CWD and CJD. However, limited epidemiologic investigations cannot rule out the possibility that CWD might play a role in causing human illness. Ongoing surveillance of CJD, particularly in states with CWD, is important to assess the risk, if any, for CWD transmission to humans. Because the confirmation of CJD and the detection of a new prion disease require neuropathologic study of brain tissue, physicians are encouraged to contact NPDPSC (http://www.cjdsurveillance.com; telephone, 216-368-0587) to confirm diagnoses of CJD and to distinguish its various subtypes. Because of the known severity of TSEs in humans and the possibility that the CWD prion can affect humans, animals with evidence of CWD should be excluded from the human food or animal feed chains. Hunters and wild venison consumers should follow precautionary guidelines available from the Wisconsin Department of Agriculture, Trade, and Consumer Protection (http://datcp.state.wi.us/core/consumerinfo) to prevent potential exposures to the CWD agent.

For the entire report link to: Morbidity and Mortality Weekly Report

REF: *Morbidity and Mortality Weekly Report*, February 21, 2003 / 52(07);125-127

Toxicology Tidbits

· Adverse Human Health Effects Associated with Molds in the Indoor Environment

In recent years, the growth of molds in home, school, and office environments has been cited as the cause of a wide variety of human ailments and disabilities. So-called "toxic mold" has become a prominent topic in the lay press and is increasingly the basis for litigation when individuals, families, or building occupants believe they have been harmed by exposure to indoor molds. This evidence-based statement from the American College of Occupational and Environmental Medicine (ACOEM) discusses the state of scientific knowledge as to the nature of fungal-related illnesses while emphasizing the possible relationships to indoor environments. Particular attention is given to the possible health effects of mycotoxins, which give rise to much of the concern and controversy surrounding indoor molds.

This is among the more comprehensive and objective analyses of this topic and can be found at: http://www.acoem.org/

Editorial Note: Thanks to Dr. Dan Sudakin, Oregon State University, for bringing this article to our attention.

· DPR Registers 33 New Chemicals in 2002

The California Department of Pesticide Regulation registered 33 new pesticide active ingredients in 2002, the most registered by DPR in any year since 1997.

New active ingredients included 14 formally designated as reduced-risk chemicals, also the most since 1997. (In 2001, there were 22 new registrations, nine of them reduced risk.) Reduced-risk chemicals -- designated by the U.S. Environmental Protection Agency -- typically feature less toxicity, allow lower application rates, or possess other desirable qualities compared to traditional pesticides.

DPR Director Paul Helliker said the increased number of new registrations was due, in part, to DPR's ongoing efforts to speed approval for reduced-risk chemicals by working on registrations simultaneously with the U.S. Environmental Protection Agency.

"All new pesticides must be approved by U.S. EPA before they can be registered in California or any other state," explained Helliker. "Since we want to encourage the use of reduced-risk products, we have conducted concurrent evaluations with U.S. EPA to bring these products to California as quickly as possible."

DPR will continue to expedite the registration of new biopesticides in 2003. However, the number of new registrations for reduced-risk compounds may decline. Due to registration staffing cutbacks, DPR no longer conducts concurrent evaluations for reduced-risk chemicals.

California currently has about 920 registered pesticide active ingredients used in approximately 12,038 pesticide products.

The list of new active ingredients in 2002 may be found at http://www.cdpr.ca.gov/

REF: California Department of Pesticide Regulation News, February 6, 2003 (03-04)

· Gateway to Government Internet Resources Launched

Your days of surfing the Web for that specific government resource may be over. Bookmarking a new FirstGov for Science Web site, www.science.gov, may be the only divining rod you need. The site provides a gateway to authoritative, timely, select science information provided by U.S. government agencies, including research and

development results.

From www.science.gov, users can easily find more than a thousand government information resources, including several hundred sites for the Department of Agriculture's Agricultural Research Service. The free resources at the linked sites, which do not require registration, include technical reports, journal citations, databases, and fact sheets.

FirstGov for Science is intended for the educational and library communities, as well as for business people, agency researchers, and anyone with an interest in science and technology. Fourteen scientific and technical information organizations from 10 major science agencies collaborated to create the site.

Participating organizations include the departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, and Interior, along with the Environmental Protection Agency, NASA, and National Science Foundation.

REF: *JAVMA News Online*, February 15, 2003

• Risk Analysis

USDA/FSIS Current Backgrounders and Key Facts

Increased awareness of the scope and magnitude of foodborne disease, as well as the emergence of previously unrecognized human pathogens, have prompted regulatory officials to consider new and improved strategies to reduce the health risks associated with pathogenic microorganisms in foods. While regulatory decisions regarding the management of foodborne disease risk have traditionally been made with the aid of the scientific community, the development of formal risk analysis provides a conceptual and transparent framework for evaluating the public health benefits associated with the selection of various policy options. The risk analysis paradigm includes three elements -- risk assessment, risk management, and risk communication -- and allows regulatory officials to focus finite resources on those hazards that pose the greatest risk to public health.

For the entire report link to: USDA - FSIS Press Release,

REF: USDA/Food Safety and Inspection Service Press Release, February 2003

VETERINARY NOTES.....

CAST Animal Biotechnology Paper Summarizes Existing and Emerging Technologies and Their Current and Potential Impacts

The Council for Agricultural Science and Technology (CAST) has released a scientific paper that provides policymakers and others with an overview of existing and emerging biotechnologies in animal agriculture. Written by a task force of nine scientists and three reviewers, the new issue paper suggests that research on biotechnology in animal production is leading to breakthroughs on many fronts, which raises questions of the comparative risks and benefits as well as ethical considerations. Consumers, farmers, and the environment have the potential to benefit from this research, according to Terry D. Etherton, Department of Dairy and Animal Science at Pennsylvania State University, and chair of the CAST task force.

"Scientists have been making impressive strides in developing animal biotechnologies," Etherton says. " Some of the newest approaches involve animals as sources of pharmaceuticals for human medicine or of organs for people awaiting transplants. Then there is the issue of animal biotechnology helping to maintain food safety or contributing to farming practices that are economically and environmentally more sustainable." The CAST paper, Biotechnology in Animal Agriculture: An Overview, (Issue Paper 23) addresses several aspects of animal biotechnology and attempts to increase public understanding on related scientific, economic, legislative, ethical, and social issues.

Uses in Medicine

According to Teresa A. Gruber, CAST Executive Vice President, "Livestock have a long history of use in the production of medicine for humans. For example, animals have traditionally been used to produce anticoagulants, heart valves, antisera and sera, and collagen for medical purposes. But now biotechnology presents the opportunity for more economical, ethical production of these and other important medical products."

Several companies are producing human proteins in milk and in eggs, which will be used to benefit biomedicine. Another biotechnology under development uses animals to produce donor organs for human transplant. It is possible that genetic engineering can be used to produce immune, rejection-free organs in increased quantities.

Uses in Food Safety

Advances in biotechnology research have allowed significant improvements in diagnostic approaches to food safety, as well. "Advances in biotechnology, especially in the last five to ten years, have transformed approaches to assuring the microbial safety of foods," states Etherton. Microbial biotechnologies are currently being used to screen for Salmonella, Escherichia coli, and Listeria monocytogenes.

Producers and regulators are looking for ways to identify high quality, biosecure products. The potential for livestock producers to use DNA "fingerprints" to determine herd identity or to track a product from producer to consumer is being explored.

Uses in Farming

Biotechnology provides a way for farmers to change the genes of animals to achieve better health and production. It also offers a way of improving animal feed, which makes up approximately 70% of the cost of farming. Compounds called metabolic modifiers have been created through biotechnology. A commonly used modifier called bST is used in dairy cows to increase milk yield, to achieve unprecedented improvements in milk-to-feed ratio, and to decrease waste.

Approximately half of U.S. dairy herds are receiving bST supplements and nineteen countries around the world have approved this biotechnology for commercial use.

Environmental Impacts

Biotechnology also offers farmers a chance to decrease the amount of manure produced, as well as the amount of nutrients and odors from manure. Animal manure, especially swine and poultry manure, is high in nitrogen and phosphorus. Both nutrients contribute to surface and groundwater pollution and to poor air quality and to offensive odors.

Ethical Considerations

The authors suggest that as we explore the benefits and risks of applying biotechnologies in animal science, we need to continuously weigh the ethical and social consequences.

REF: CAST News Release, February 2003.

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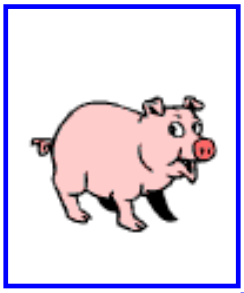

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