

education by speeding up, rather than slowing down, the learning process for at-risk kids. The result has been substantial improvement in test scores for all kids, with seventh graders showing test score improvements of more than a grade level in math, and most eighth grade students going on to take geometry in high school.

Other efforts include "Humanitas," a Los Angeles-based program that encourages team-teaching based around a relevant theme to engage

kids in the learning and writing process; Barrios Unidos, a Santa Cruz program that brought together teenagers, their parents and community sponsors to build a soccer field and park as an alternative to violence; and LA's BEST, a Los Angeles-based organization that hopes to steer kids away from violence by providing them with after-school activities, such as tutoring younger kids, designed to boost their self-esteem.

—Editor

Lead poisoning continues to pose threat

Despite recent efforts to reduce the amount of lead in the environment, lead poisoning remains one of the most common environmental health problems for children in the United States today.

The Centers for Disease Control (CDC) and the

American Academy of Pediatrics have both called for universal screening of children ages 6 months to 6 years in an effort to ward off the physical and developmental problems associated with even relatively low blood levels for lead.

In addition, the CDC recently lowered the acceptable blood lead level from 25 to 10 micrograms per deciliter ($\mu\text{g}/\text{dl}$) — the lowest level yet at which effects from lead exposure have been seen.

One of the most effective ways to deal with the problem continues to be education. UC Cooperative Extension efforts to educate Californians about the dangers of lead poi-

soning and methods for its prevention include workshops for community health care workers, as well as the development of a lead test designed to determine if household ceramics and pottery are leaching lead (see opposite page).

Nutrition Science Specialist Sheri Zidenberg-Cherr, colleagues from the Department of Nutrition at UC Davis and county advisors in Tulare, Fresno and San Bernardino, are conducting research designed to determine what impact diet has on a child's susceptibility to lead poisoning. If a relationship between certain nutrients and lead absorption can be found, then detailed nutrition education programs might be targeted to high-risk populations, she explained.

Chronic exposure to lead can lead to serious health and behavioral problems such as anemia,

kidney disease, lower IQ and other permanent cognitive deficiencies, Zidenberg-Cherr noted.

Children are considered especially at risk of lead poisoning because their central nervous systems are still developing. They are also the ones most likely to pick up lead in the environment through crawling or putting things in their mouth.

Although blood lead levels for children have dropped in the last decade, due in part to such efforts as banning lead-based house paint and introducing lead-free gasoline, experts remain concerned about the effects of low-level exposure from such sources as water, soil, and the colorful pottery Americans may pick up when traveling.

The most common source of lead poisoning is lead-based paint which was commonly used in homes until it was banned for such use in 1977. Children who live in older homes are at risk of lead poisoning, especially if the paint is chipped or peeling, or the house is undergoing renovation. Lead also can be ingested or inhaled from dust kicked up during remodeling.

Lead exposure also can occur in some jobs, such as radiator repair or battery making, and in some hobbies, such as working with stained glass which uses lead in the soldering process.

Children of migrant workers are considered at high risk of lead exposure due to environmental contamination in their homes and work environments. Poverty is a risk factor for lead toxicity, in part because more low-income children live in older, dilapidated homes. People who are poor may not have adequate diets, which can increase a child's susceptibility to lead poisoning, according to Zidenberg-Cherr.

Animal studies have shown that diets low in calcium or iron, or high in fat, can enhance lead absorption.

Zidenberg-Cherr's study involves more than 200 children between the ages of one through five.



Cookie Monster decorates a "hot" lead-leaching piece of ceramicware. However, similar plates made of plastic do not leach lead. (Photo by Ron Goble)

The study population comes from San Bernardino, Fresno, and Tulare counties, all counties within the top 10 for reported elevated blood lead levels in children. In addition, Sonoma County was also sampled since it is in the top third of California counties with houses built prior to 1950.

Using a Food Frequency Questionnaire and three 24-hour dietary recalls, along with blood tests, Zidenberg-Cherr hopes to determine whether diets low in such nutrients as calcium, iron and zinc increase a child's susceptibility to lead toxicity.

The pilot project is also designed to test how well their methods work in getting dietary information about children. Among other things, parents are asked to recount what their children typically eat and the size of their portions. "With kids that's really hard," she said.

Zidenberg-Cherr said this study is designed to determine whether a relationship exists between

certain nutrients and blood lead levels. She hopes to conduct a second study, using the results from the current study to determine whether supplemental diets might be used as a means to reduce lead toxicity in children.

The California Department of Health has estimated that some 80,000 children have blood lead levels above 15 ug/dl. Children with extremely high blood lead levels are treated with drugs called "chelators" which have the ability to bind to lead and remove it from the body. Cost of such treatment is dependent on severity, and ranges from about \$200 to \$5,000, Zidenberg-Cherr said.

Some have argued for universal screening, which would cost about \$25 per child, she said. Reaction among health care professionals is mixed in part because of the cost, and because no therapy is available for children with slightly elevated blood lead levels, beyond simply removing the sources of lead and educating parents. — *Editor*

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UC offers lead test around state

For the past few years, UC Cooperative Extension offices around the state have been offering what they call the "UC Quick Lead Test," a 20-minute test which can determine whether a piece of pottery or ceramic ware is leaching lead.

Many pottery glazes contain lead, which adds color, texture and luster. When properly fired — or heated to a high enough temperature for a long enough time — the metals become incorporated into the glaze and are resistant to acid leaching.

But some pottery isn't properly prepared or fired. Glazes that are cracked or worn can also cause leaching of lead when they come into contact with acidic foods, such as tomatoes, according to UC Home Economist Shirley Peterson.

In 1991, concerned about the health effects of lead, the U.S. Food and Drug Administration (FDA) issued new guidelines concerning pottery and ceramics manufactured in, or imported to, the United States. Pottery made in the United States, or foreign pottery imported through FDA-approved channels, are screened for leachable lead. Not all pottery or ceramics manufactured in foreign countries meet FDA standards. Tourists and military may bring home dishware from foreign countries, which are not subjected to the screening process, but may contain leachable lead. Lead can also be found in antiques.

The UC lead test, which is adapted from an FDA test, uses a mixture of citric acid, "about as

strong as lemonade," which is placed on all colors in the pottery that come into contact with food, Peterson said. After standing for 20 minutes, some of this citric acid is transferred to filter paper, where it is tested with rhodizonic acid, which turns from goldenrod to pink on contact with lead. The darker the pink, the more lead is there.

Cooperative Extension originally offered the test at a Davis farmers' market and the Sacramento County Extension Office. Of 92 pieces tested, they found more than 6% leached lead, many of them pieces from Mexico, in which the glaze had been poorly or incompletely applied, and the pieces gave a "thunk" when tapped, which is indicative of ceramic ware fired at a low temperature.

Peterson said the lead tests are available at many of the Cooperative Extension offices. In addition, they can be obtained commercially for people who are concerned about the safety of their ceramic ware. — *Editor*



UC's 20-minute lead test uses citric acid to determine the presence of leachable lead in pottery.