

CHEMISTRY

To slow tin fizz

When a warehouse becomes a hothouse, the corrosion of the tin in cans of orange juice accelerates, reports Steven Nagy and colleagues of the Florida Department of Citrus, Agricultural Research and Education Center in Lake Alfred, Fla. In studies reported in the November-December *JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY*, Nagy and co-workers evaluated the influence of temperature on the dissolution of tin containers packed with single-strength orange juice. The researchers found that storage of juice below 43°C (109.4°F) should not cause the tin content of juice to exceed 250 ppm—the Codex Alimentarius Commission's limit—if the juice is stored for 12 weeks or less. Temperature-abused products—that may contain an excess of tin—can be recognized by their dark-brown appearance or aged, rotten flavor.

The cost of conservation chemicals

Current energy conservation programs encourage homestead "tightening"; after all, an insulated home means conserved energy, which in turn means reduced U.S. dependence on foreign oil. Who can criticize such a strategy?

Peter A. Breyse can. "There is no doubt that unless a reasonable and logical plan is developed, the deleterious health impacts of excessive home tightening will be enormous," writes Breyse of the University of Washington School of Public Health and Community Medicine in a Jan. 16 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* editorial. The use of urea-formaldehyde foam insulation, he says, is one example.

Because of its high R value—a measure of resistance to heat loss—urea formaldehyde foam is one of the most popular materials used for additional insulation of walls in existing buildings. The substance—a mixture of urea, formaldehyde and water with an acid catalyst and a compressed-air propellant—already has been installed in about 500,000 homes. Evidence now seems to be mounting that residents of these homes may be exposed to significant amounts of irritating and possibly cancer-causing formaldehyde fumes.

During the past four years, for example, University of Washington personnel investigated health complaints from 600 persons exposed to formaldehyde from either foam insulation or particle board and plywood in their homes. The complaints ranged from flu- and cold-like symptoms to chest pains and heart problems, Breyse reports. In the same *JAMA* issue, doctors of the Rocky Mountain Poison Center in Denver report the complaints of similar symptoms from more than 100 occupants of homes insulated with urea formaldehyde foam. Moreover, laboratory tests indicate that formaldehyde causes cancer in animals.

As a result of these and other studies, the Consumer Product Safety Commission last month voted 3 to 2 to ban further use of urea formaldehyde foam insulation—a ban that would deal a \$160 million blow to the foam insulation business. The controversial ban, however, may never take effect: Commission chairman Susan King, who voted in the majority, resigned Jan. 31, and President Ronald Reagan probably will name a successor before cpSC's final vote on the insulation matter.

Meanwhile, Breyse urges consideration of other consequences of home-tightening. "For example, electrostatic air cleaners produce small amounts of ozone that can accumulate to dangerous concentrations under minimum air-entry conditions," he says. In addition, "Many people are converting to woodburning stoves; without adequate ventilation, dangerous levels of carbon monoxide will result."

Says Breyse, "Now is the time to call a temporary halt to our home energy conservation programs until all aspects of 'building tightening' can be reviewed."

BEHAVIOR

New hope for old brains

Some of the nation's leading brain scientists met in Washington last month and an optimistic view of advances in neurobiology and mental health emerged from their get-together, as reported in the February *APA MONITOR*. Part of that optimism was expressed by Marion Diamond, professor of physiology and anatomy at the University of California at Berkeley. She reports that the aging brain may have vast capabilities. It is not true, she says, that during adulthood more than 100,000 brain neurons die every day. Her tests on laboratory rats showed no significant loss of brain neurons after 100 days of age (the equivalent of young adulthood for humans) and until 650 days of age, which is a very long life for rats. Whatever decreases found in the number of neurons present took place before 100 days of age.

Diamond feels that environmental factors, such as social and cultural conditions, exercise and nutrition have important effects on brain development. She found that the thickness of the rats' cortex, which indicates the richness of cortical connections, could be increased at any age by putting the rats into enriched environments with larger cages, several rats and many objects to manipulate, climb or slide on. Even the very old rats' brains showed an increase in cortical thickness with more dendritic branching under these conditions. The increase among old rats was much smaller than the increases observed for infant rats placed in enriched environments; younger brains appear to be more responsive to environmental influences. But the aging process may not have the degenerative effects on brain physiology that some investigators have suggested.

How do you grade teachers?

The results of a recent Georgia study, according to the researchers, cast doubt on some commonly held assumptions about what makes for a good teacher. Homer Coker of Georgia State University, Donald Medley of the University of Virginia and Robert Soar of the University of Florida, whose project is reported in the February *PSYCHOLOGY TODAY*, recruited 60 teachers from all public school grades in a semi-rural county west of Atlanta. For two years trained observers visited the classrooms periodically and reported how well the teachers did on 25 abilities often measured in teaching competency tests. At the beginning and end of each year the researchers examined two measures of the students' progress: their scores on standardized academic achievement tests and on a test of self-esteem. When student and teacher results were compared, few clear patterns emerged. About half the teaching measures had no significant relationship to either student measure, or did for students in some grades but not in others. Some were associated with gains in one student measure and declines in the other, and several actually seemed to have negative effects. Skills such as using praise and rewards, eliciting and responding to student questions, using nonverbal communication and giving students a voice in making decisions appeared to have a negative effect on academic achievement. The skills that seemed to have negative effects on students' self-esteem included making contact with students when they strayed from work on an assigned task, using "supportive" classroom-management techniques and, again, using nonverbal communication.

These results are preliminary, and are taken from only a small group of teachers in a single school system. But the mixed and negative support the data offer for what are believed to be important teacher qualities surprised and distressed the researchers. Future investigations, they say, must establish whether teacher competency testing in its present form is valid, and they conclude that their findings "... emphasize how urgently answers are needed."