Science Update

African-American Teens Seen Low in Vitamin D

A joint study with university investigators funded by the National Institutes of Health has shown that levels of the kind of vitamin D that's critical for building strong bones and maintaining a robust immune system have been found insufficient in 359 African-American youths aged 15 to 19. Eighty-seven percent of the volunteers tested were found to have insufficient amounts of what's called "25-hydroxy-vitamin D" in their plasma. The group represented a majority of participants in the federally funded REACH investigation—short for Reaching for Excellence in Adolescent Health.

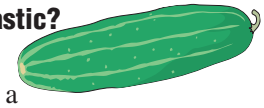
The shortfall was unexpectedly high. Good sources of the nutrient include vitamin D-fortified milk, fatty fish, and exposure to sunshine, which can be converted by a natural chemical in skin to a form called "previtamin D3." *Charles B. Stephensen, USDA-ARS Western Human Nutrition Research Center, Davis, California; phone (530) 754-9266, e-mail cstephen@whnrc.usda.gov.*

Stop Runaway Phosphorus With Gypsum

A study comparing the capacity of three amendments to hold soluble phosphorus in place in a field containing more than 10 times the phosphorus normally found in soils showed gypsum to be best. Gypsum is a soft, widely distributed mineral commonly found in sedimentary environments and is also a byproduct of coal-burning operations. The other materials tried were alum and ground-up wastepaper.

The testing was done near Kurten, Texas, on land that had received manure applications from dairy and egg-laying operations for more than 40 years. Excessive use of manure and other fertilizers can significantly increase soil phosphorus, which, though a valuable plant nutrient, can run off and damage waterways. After applying the amendments annually for 3 years, the researchers found that 5,000 pounds of gypsum per acre best reduced soil-test values for water-soluble phosphorus. The binding together of soil particles that reduced the phosphorus runoff apparently depended on continual applications. And while the wastepaper product—which contained aluminum, the active ingredient in alum—effectively curbed the phosphorus, the large amounts necessary could be impractical. *David K. Brauer, USDA-ARS Dale Bumpers Small Farms Research Center, Booneville, Arkansas; phone (479) 675-3834, e-mail dbrauer@spa.ars.usda.gov.*

Pickled Dills in Plastic? Turmeric's Key



Who knew that a spice used from ancient times as a coloring agent in foods could also keep plastic-packaged dill pickles fresh? Unlike glass containers, plastic jars or pouches "breathe," allowing oxygen and other gases to seep inside over time. This can eventually lead to oxidative off-flavors in pickled cucumbers.

Pickle packers would like to use more plastic packaging because it's lighter and less breakable than glass jars—and can be easier to open. Now research has shown that simply adding just the amount of turmeric currently used as a yellow coloring in some commercial pickles can prevent buildup of flavor-altering aldehydes and result in good quality fresh-pack dills. *Roger F. McFeeters, USDA-ARS Food Science Research Unit, Raleigh, North Carolina; phone (919) 515-2990, e-mail rfm@unity.ncsu.edu.*

A Hard-To-Swallow Wort!

They're invasive and destructive, and they're taking over large areas of New York, New England, and Ontario. They sound innocent enough—called "pale swallow-wort" and "black swallow-wort," and both are members of the milkweed family. They've come from Europe, where natural insect and plant disease enemies likely keep them in check. Here, they're running amok because the vines contain strong and unique poisons that appear to limit their natural enemies. Even deer won't feed on them.

Both swallow-wort species may be threatening monarch butterflies by displacing the common milkweeds on which they feed. Monarch larvae can't survive on swallow-worts. The vines are also encroaching on no-till corn and soybean fields and Christmas tree farms. To find biological ways to curb this invasive weed, ARS scientists at three locations are teaming with researchers at Cornell University in Ithaca, New York. *Lindsey R. Milbrath, USDA-ARS Plant Protection Research Unit, Ithaca, New York; phone (607) 254-7268, e-mail lrm32@cornell.edu.*

Soy Hulls: A Water Pollution Solution?

It's always good news when something that's a near worthless throwaway—or worse, a disposal problem—gets turned into a valuable, useful product. That's what's happening to the hulls that protect developing soybeans. Typically, soybean hulls end up as livestock feed.

But they—as well as leftover stalks from corn and sugarcane—make an ideal foundation for a potent filtering agent that can adsorb harmful levels of lead, chromium, copper, and cadmium from contaminated waters. In just two steps, these plant residues can be converted to what's known as a "dual-functioning ion exchange resin." They become a sort of biological magnet for attracting both positively and negatively charged particles of heavy metals in water, working sort of like water softeners that draw out and replace unwanted hard-water particles, like calcium and magnesium, with ions from sodium. Adding citric acid, a widely used food additive, to plant residues produces a negative charge, while treating them with common cotton textile chemicals adds a positive one. *Wayne E. Marshall and Lynda H. Wartelle, USDA-ARS Southern Regional Research Center, New Orleans, Louisiana; phone (504) 286-4356 [Marshall] and (504) 286-4236 [Wartelle], e-mail marshall@srrc.ars.usda.gov, wartelle@srrc.ars.usda.gov.*