

Taking an Inside Look at Salmonella

Roughly 2 million cases of *Salmonella* infection are found in U.S. livestock each year, costing a hefty \$1.4 billion, on average. Certain swine seem prone to shedding the bacteria during the stress of going to market. Why some animals have the problem, and not others, has not been understood.

Curious about the interior progression of infection in live animals, scientists have found a way to photograph *Salmonella* bacteria as they move through pigs. The new technology, called biophotonics, uses light to mark molecular changes. Bacteria are treated in such a way as to give off light, making it possible to track infections in living piglets and through tissues of adult pigs after slaughter.

Eventually, the researchers hope to adapt the technique so cameras will be able to see through the denser mass of live, market-ready pigs. Having that ability would help scientists research ways to identify animals that are more susceptible to infection and prevent those swine from spreading infection to their herd mates. *Donald C. Lay, Jr., USDA-ARS Livestock Behavior Research Unit, West Lafayette, Indiana; phone (756) 496-7750, e-mail layd@purdue.edu.*



More Trans Fats Mean More “Bad” Cholesterol

Higher levels of dietary trans fatty acids have been linked to higher blood levels of small, unhealthy particles of low-density lipoproteins (LDL).

Trans fatty acids are formed during hydrogenation, the process by which oil is transformed from a liquid state to a more versatile, solid fat for use in

thousands of processed foods. LDLs circulate in the bloodstream as constellations of small, medium, or large particles. Since they carry around most of the cholesterol to parts of the body, they’re thought of as “bad.” Smaller particles are likely to deliver more cholesterol to the blood vessel wall than larger ones, so even relatively small amounts of them can lead to problems—even in people with normal blood levels of LDL-cholesterol.

In a 6-month study, 36 volunteers were provided with each of five different experimental diets with varying levels of trans fatty acids for 35-day periods. The diets higher in trans fatty acids led to increased levels of the small, dense LDL-cholesterol particles, the type of LDL more likely to produce plaque in arteries.

This finding reinforces the importance of consuming a diet that is low in both trans fats and saturated fat to favorably affect cholesterol levels. *Alice H. Lichtenstein and Susan M. Jalbert, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts; phone (617) 556-3127 [Lichtenstein], (617) 556-3104 [Jalbert], e-mail alice.lichtenstein@tufts.edu, susan.jalbert@tufts.edu.*

Fake Rocks Roll Merrily Along

Concrete “rocks” the size of racquetballs, but weighing about the same as average stones of similar size, have been outfitted with internal transponders. Why? Watershed researchers want to learn how far they travel when sudden summer thunderstorms send them rolling and tumbling along the dry stream beds of the parched Southwest. They’re tracking the movements of about 200 of these inexpensive but high-tech, fake rocks distributed at three Arizona watershed locations.

Signals made by the transponders when a battery-powered antenna is swept over them enable the scientists to easily find all the research rocks carried

downstream. Global positioning equipment logs the exact locations. One thing the data generated might do is serve as a basis for mathematical formulas to aid reservoir managers in estimating the amount of rock and sediment carried into reservoirs after thunderstorms. *Mary H. Nichols, USDA-ARS Southwest Watershed Research Center, Tucson, Arizona; phone (520) 670-6381, e-mail mnichols@tucson.ars.ag.gov.*

Autumn Mowing May Cut Herbicide Need

Russian knapweed is a problem in ranges and pastures in the western United States, where it grows up to 4 feet tall and takes over otherwise productive land. Once established, Russian knapweed may be difficult to control. Currently, most producers apply chemicals on rangeland in spring or summer, when knapweed begins to flower, but research is showing that fall application may be preferable.

On two study sites in eastern Oregon, tests were done using a new piece of equipment that mows and applies herbicide in a single pass. They showed that mowing just before herbicide application puts more herbicide on the intended target—the soil surface. Rains later carry the herbicide into the root zone, and from there it’s drawn up by growing weeds the following spring. Its degradation is slowed by the low soil temperatures of fall and winter.

Though most farmers don’t mow their weeds, the added cost of this measure may be offset by a reduced need for herbicide, and the knapweed might be more effectively controlled. *Michael F. Carpinelli, USDA-ARS Range and Meadow Forage Management Research Unit, Burns, Oregon; phone (541) 573-8911, e-mail michael.carpinelli@oregonstate.edu.*