Environment

Regs don't cover arsenic-laced poultry waste

by Jonathan L. Clark

Animal waste being exported from factory farms in the Chesapeake Bay watershed to other parts of Pennsylvania might contain arsenic that can contaminate groundwater, yet Pennsylvania's environmental regulations ignore the risk.

Pennsylvania's nutrient management regulations are designed to regulate nutrients such as phosphorus and nitrogen, not arsenic or the other potentially harmful substances that, according to a 2004 U.S. Environmental Protection Agency report, can be found in manure.

"Modern agriculture with its emphasis on intensive housing and speeding the growth of livestock to market weight has employed a variety of substances that have not been used before in animal husbandry," states the EPA's Risk Assessment Evaluation for Concentrated Animal Feeding Operations, known as CAFOs. "These include antibiotics to combat the spread of disease among animals housed in close quarters, natural and synthetic hormones to speed growth, and metals (As–arsenic, Cu–copper, Zn–zinc) to do the same and preserve the freshness of feed."

Feeding poultry with an organic form of arsenic called roxarsone can contaminate the manure with inorganic arsenic, a known carcinogen, two Duquesne University scientists told *Voices* in a recent interview. Spreading such manure on the ground creates "a potential that the inorganic arsenic can enter drinking water systems," said Parthu Basu, whose paper co-authored with John Stolz was published in January in a peer-reviewed journal.

How great is the risk?

"When presented in the large amounts of manure generated at CAFOs and stored on-site," the EPA warned, "these other substances pose a threat to the environment."

The Pennsylvania Department of Environmental Protection attempted to downplay the risk.

"It is estimated that only 10 percent of poultry in Pennsylvania would be fed any amount of arsenic compounds," according to Kerry Chippo, spokesperson for the DEP.

But manure from birds that are fed arsenic must go somewhere and existing regulations allow it to be spread on cropland without regard to its arsenic content.

"To the best of my knowledge, the arsenic content of manure that is spread on cropland is unregulated in Pennsylvania," explained Doug Goodlander, nutrient management program director for the State Conservation Commission, which developed Pennsylvania's nutrient management regulations. "The SCC only has the legal authority to regulate nutrients," he said, "and arsenic is not a nutrient as defined by the law."

Spreading the problem around?

The DEP recently approved several proposals to transport poultry manure out of the Chesapeake Bay watershed to other parts of Pennsylvania. Many CAFOs in Pennsylvania's portion of the watershed generate excess manure. This manure contains more nutrients than the crops grown on the operations need. As a solution, the DEP supports transporting excess manure to places that need the nutrients and spreading it on the ground there. But if manure contains arsenic, Stolz said, transporting it could "possibly expose people to arsenic-laced chicken manure in places where chickens are not even produced."

Red Barn Consulting is a company that helps poultry farmers transport manure. Poultry companies contract with individual farmers who raise birds owned by the companies. The companies supply the feed and decide what is in it; the farmers own the manure and are responsible for managing it. Red Barn helps farmers manage excess manure.

"Consumers want low prices for their food and they are unwilling to accept the reality of how that happens," Red Barn Vice President of Engineering Molly Hughes told *Voices*. "Red Barn would be arrogant to think we could significantly influence the market or the environment of poultry production with regard to the use of roxarsone and other additives; however, we will do what we can to make our clients aware of all potential health risks associated with this use." She said Red Barn does not intend to refuse to help transport manure that contains arsenic.

The DEP doesn't know enough to know what to do.

In a 2004 scientific review article, soil scientists argued that regulations governing land application of manure should consider not only nutrients, but also metals such as arsenic. And in the September 2005 issue of *Environmental Health Perspectives*, researchers from Johns Hopkins University suggested that "[t]he removal of arsenic from animal feed is a critical step toward safe poultry waste management."

Photo from http://sawg.cas.psu.edu

A farmer uses a machine to spread manure on a Central Pennsylvania farm. Poultry waste from the Chesapeake Bay watershed is being transported to western Pennsylvania to spread on farmland.

Despite the call for regulation, Chippo said that DEP is not ready to regulate.

"This is an emerging issue for Pennsylvania DEP," she said, "and as such, a greater understanding and more research is required prior to seeking to regulate beyond our current requirements."

Current requirements include a new standard for arsenic in public drinking water, Chippo explained. But private wells—including wells located in areas where poultry manure is spread—are not regulated by DEP.

"DEP also regulates the land application of manure using its authority through the nutrient management act/nutrient management plan," Chippo added. Yet as Goodlander explained, Pennsylvania's nutrient management regulations were not designed to address the risk that poultry manure will contaminate groundwater with arsenic.

Finally, Chippo cited regulations designed to protect surface water rather than groundwater.

"The study and potential impacts of poultry given roxarsone is fairly new science to Pennsylvania DEP," Chippo admitted. "At this point not enough is known on the potential impacts, if any, to water quality to state at this point whether further action is needed by the department. DEP is looking into these concerns and will continue to examine the science and take any necessary steps to ensure that the water quality of Pennsylvania is not impacted."

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Rendell pitches energy plan to local business

by Cindy Hryszko

Gov. Ed Rendell's recently announced alternative Energy Independence Strategy may plan on not only saving the consumer money, but might also offer benefits to businesses in Pennsylvania.

The strategy focuses on three main goals: Saving consumers $10 billion in energy costs over the next ten years, reducing the state's reliance on foreign fuels, and growing the state's energy economy, said Kevin Ortiz, spokesperson for the Pennsylvania Department of Community and Economic Development (DCED).

Ortiz said that the main reason behind the strategy is the issue of rate caps becoming deregulated when they expire.

"Over a certain number of years these [electricity] rate caps come off and when they come off, rate prices tend to jump," he said.

By 2010, rate caps on electricity costs across the state are set to expire.

"Pike County was the first county to remove price caps," Ortiz said. "Originally, electricity bills shot up 123 percent; after some intervention from the government, it was lowered to 70 percent."

He said that the initiative plans to level off the price increases in increments during a longer period of time, rather than have such a drastic, automatic jump.

After the expiration in rate caps in Maryland and Delaware last year, customers saw rates go up 70 percent and 50 percent respectively, he said.

To reduce the state's dependence on foreign fuel, the Energy Independence Strategy calls for growing at home the same volume of fuel imported from the Persian Gulf. It will also keep the fuel dollars at home by using homegrown biofuels, ethanol and the state's coal reserves. To help achieve this, the strategy will create incentives for Pennsylvania farmers who grow the feedstock to produce ethanol and biodiesel, according to a DCED press release.

Instead of spending about $30 billion per year on imported energy fuels, Pennsylvania could use the money to develop homegrown energy sources and invest the money back in the state, rather than overseas, said Ortiz.

Every gallon of gasoline sold in Pennsylvania will also have to have renewable content or be derived from an eligible fuel, including ethanol, biodiesel, and coal-derived sources, according to the DCED press release.

To grow the state's energy economy, the Energy Independence Fund will put in $106 million for venture capital and the commercialization of new technologies that will create jobs and help the environment, said Ortiz.

"The key thing is that we're looking to use another $500 million for clean energy projects —wind, solar, clean coal. $44 million goes for rebates in terms of efficient air conditioning and refrigerators and another $200 million for solar," Ortiz said. The DCED estimates it will create 13,000 new jobs through funding such programs.

"We can assume a lot of these will be high tech jobs in the energy sector," Ortiz said. "We like to call these solid, good paying jobs."

To help protect against skyrocketing rates once the caps are lifted, the Energy Independence Fund will obtain $850 million through revenue bonds to cut consumer energy costs by $10 billion over the next decade, keeping electricity rates for businesses and the consumer consistent, said Ortiz.

The Energy Independence Fund will be highlighted by a system benefits charge on electric power consumers proposed at $0.0005 per kilowatt-hour of electricity used. This would cost 45 cents per month for the average residential customer, $3 per month for the average commercial customer, and $74 per month for the average industrial customer. As a whole, it would save the consumers an estimated 15 times more than the cost of the fee, saving the average residential customer $73 per year, the average commercial customer $425 per year, and the average industrial customer $10,000 per year, according to the DCED press release.

By reducing consumer utility bills, making Pennsylvania businesses more competitive, reducing reliance on foreign fuels, expanding energy production companies and creating more jobs, consumers will save about $10 billion over the next decade, according to the DCED press release.

"By supporting conservation and the production of renewable energy sources, we'll be able to lower demand for electricity from traditional power plants during periods of peak demand and avoid the need to build costly new power plants or long-distance transmission lines to meet our growing energy needs," DCED Secretary Dennis Yablonsky said.

Number of women in farming continues to increase

by Annamarie DiRaddo

Sustainable agriculture may use some fertilization depending on the farm and the crops, and organic farming eliminates pesticides and fertilizers used all together. These two farming methods may have their differences, but they share the same goal: creating healthier food in environmentally improved soil. Sustainable agriculture is not only a growing business for consumers, but also for women producers.

As the number of organic goods increase on the shelves, the number of women farmers has also increased. Farms managed by women have increased 13 percent since 1997, according to the United States Department of Agriculture's 2002 census. Farms managed by men tend to have at least one woman who helps operate the farm through research, planting or financial aid.

Lucinda Hart-Gonzalez is a married farmer in Jefferson County, Pa. Hart-Gonzalez said that she provides the research and planning for growing organic goods, along with planting the seeds, while her husband, Stephen, builds the fences and raised beds and works on remodeling parts of their house. They both live extremely busy lives, she said.

"I also keep an e-mail journal of our farm experience that is by now distributed on three continents in six countries that I know of, and people write back to me to share their knowledge and ideas, and sometimes just their best wishes. I will be turning the journal into a book this year," said Lucinda, who is also a professor at the University of Maryland. She added that she teaches online so she is able to maintain the farm. Stephen works with a homeless organiza-

see Farming, pg. 17

Life Cycle Assessment helps inform design

by Andy Lau

One of the key tools in the pursuit of sustainable design is Life Cycle Assessment (LCA). What LCA requires is for us to imagine an inanimate thing as having a "life," with life stages similar to living organisms (see diagram). Just like living things, each stage of a product's life has inputs from its surroundings and outputs to its surroundings. Keep in mind that these inputs typically have their own life cycles, too. Our goal with LCA is to bring all of those aspects and impacts of a product into consideration when making design decisions. As you might imagine, it is a challenging task, not only to identify, quantify and qualify all of the aspects, but to develop a process for integrating this knowledge into decision making. I address LCA in this column because I think it is relevant to making informed choices about technologies and products in our day-to-day lives.

Let's use an example that most are somewhat familiar with—compact fluorescent lamps (CFL). We will compare a 100 Watt incandescent lamp (IL) with a 23 Watt CFL because they provide roughly the same amount of light.

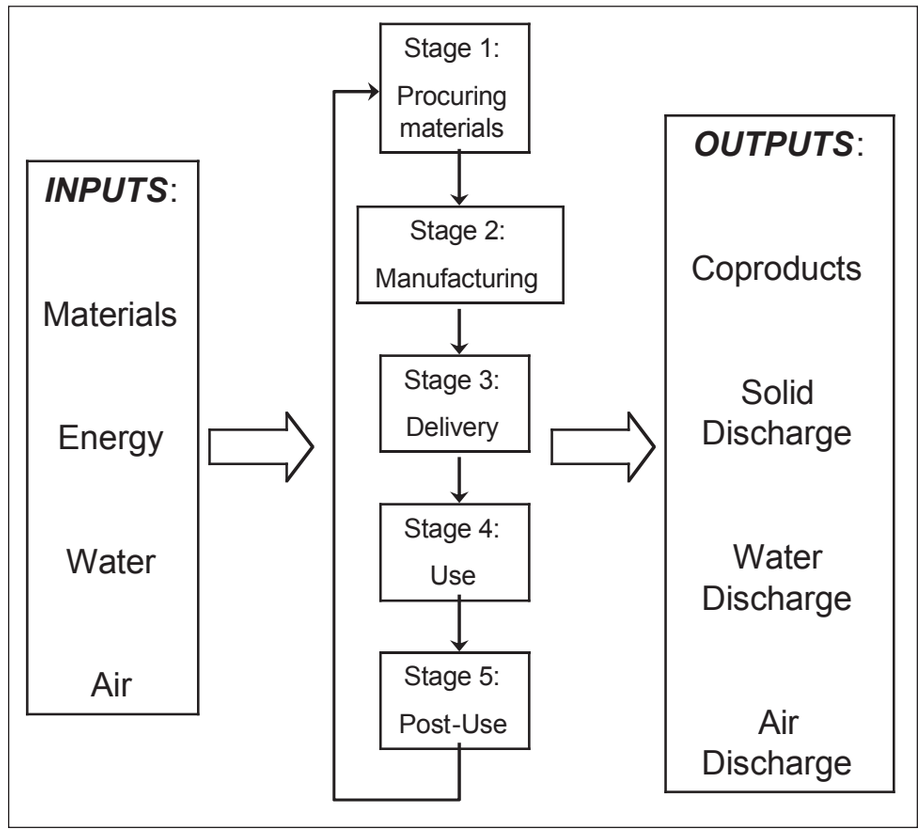
Because my space is limited here, I'll look at one major input, energy, and one major output, mercury. One of the first things you realize when applying LCA is that much of the information you'd like to consider is not readily available. Because a CFL contains more advanced and varied components in its ballast, it likely requires more energy and other inputs to manufacture, yet this data is not readily available. What we can readily assess is the electrical energy that it takes to operate the lamp in life stage four, Use. Here we then have to consider how the electricity is produced and all of the inputs and outputs associated with electricity production. And of course, direct cost needs to be considered too.

A 100 Watt IL lasts about 1,000 hours and therefore over its use life, it will use 100 kilowatt-hours of electricity. A 23 Watt CFL lasts about 8,000 hours, and over its life will use 184 kilowatt-hours. To compare them we must use a common lifetime, in this case 8,000 hours. Therefore, eight IL's are comparable in longevity to one CFL. Over this common 8,000 hour life, the CFL will use only 184 kilowatt-hours, while the eight IL's will use 800 kilowatt-hours. At a cost of 65 cents per kilowatt-hour, corresponding to Allegheny Power's current rate, that will cost $12 for the CFL and $52 for the ILs. If the CFL costs $3 to purchase and each IL is 25 cents, then the total direct cost of the lamps and their electricity is $15 for the CFL and $54 for the IL. Thus, even though the CFL appears to cost about 12 times more to purchase ($3 versus 25 cents), over its life it will save $40. That's a pretty good return-on-investment. But that is not the whole picture regarding energy.

The electricity used for lighting in our homes ultimately turns into heat and actually helps to heat our houses. So if it's cold enough outside to need heat and we use less electricity for lighting via CFLs, we will need to use more energy to heat our houses. To assess, this requires consideration of the heating system efficiency, the type of fuel used, and how much it costs. In summer, saving lighting energy will reduce our need for air conditioning, or without air conditioning, keep our homes cooler. This issue will be the topic of next month's column.

A significant drawback to CFLs is that they contain mercury, on average about four milligrams per lamp according to the Pennsylvania Environmental Protection Agency (EPA). ILs do not contain any mercury. They do contain tungsten and other chemicals, but again no information is readily available on the amount and hazard. Yet if we look at the bigger picture and consider how the electricity is generated, we find that coal-fired power plants emit a considerable amount of mercury too. A 2002 EPA study showed that when you consider the power plant emissions, more mercury (10 milligrams) is released into the environment with ILs than with CFLs (6.4 milligrams—four milligrams from the lamp and 2.4 from the power plant). But any mercury released should be avoided if possible, and there are some initiatives under development to recycle CFLs and to reclaim the mercury.

Thus far we have shown that CFLs use much less electricity, cost much less, and when considering power plant mercury emissions, release less mercury. Next month we'll take the next step of looking at the impact of switching to CFLs on heating and cooling issues.



Seaside vacation a treat for birdwatchers

by Alice Fuller

BIRD Watch

During our annual vacation week in February at a timeshare in Ocean City, Md., we always expect to see a great variety of birds, and this year was no exception. In addition to the many species that swell our annual bird list, an unusual bird or two always turn up and give our week a special bit of excitement.

We headed to Ocean City in mid-February on a Friday, knowing it would be an intense birding weekend because nine other birders would be joining us. Our daughter Roana drove with us, and two friends, Debra and Nan, followed behind us. We left snowbound Pennsylvania behind as we crossed into Delaware and saw only traces of snow for the first few miles. As we headed into Bombay Hook National Wildlife Refuge, we began to see white-covered fields—covered not with snow but rather with hundreds of snow geese. Occasionally, a flock would spring up into the air, resembling a mini-blizzard.

Much of the water area was frozen, but we still found a number of ducks including buffleheads, hooded mergansers and mallards, as well as a small flock of tundra swans. It was here that we saw one of those special birds I mentioned. At the edge of the road that winds through the refuge sat a tiny Savannah sparrow. This pretty and heavily streaked little bird did not seem to mind our monster machines pulled up beside it. I cannot recall ever getting such a good look at this bird of marshes, fields and meadows.

A little farther on we saw several dunlin, a small shorebird, walking one behind the other and busy plunging thier longish bills into the wet soil. They were in their winter gray and white plumage, but in a few weeks dunlin may stop off in our area en route to their breeding grounds in the tundra. Then they will be handsome with rusty-red backs and a black patch across the belly.

Three other birding couples arrived in Ocean City later that day, and the following morning they and the trio that shared our comfortable condo headed to Chincoteague National Wildlife Refuge down the Delmarva Peninsula in Virginia. I was about wiped out after a long day of driving and birding, so Ted and I got a good night's rest and then made a leisurely trip to join our birding companions.

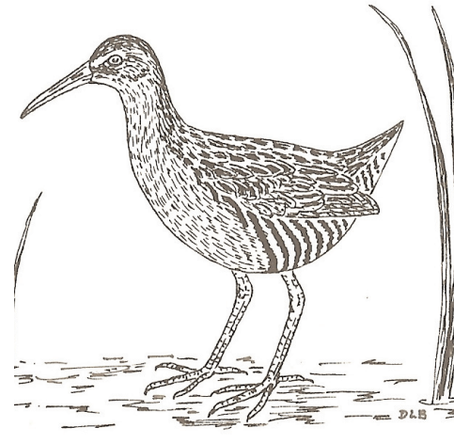
As we headed south, we first stopped at Fourth Street, which ends in the Intracoastal Waterway. A flock of handsome brant geese were loafing on an island there, and several oystercatchers were busy working among the oyster shells. A flock of red-breasted mergansers swam nearby, as did one common loon.

We also made stops at other favorite birding places, finally meeting up with our fellow birders at a parking lot near the park headquarters. They had just learned about a rare winter visitor and we, too, were lucky enough to see the little eared grebe. Like the more common horned grebe it, too, has a winter plumage that is dark gray above with white underparts and an upturned cap.

The leaders in our group then took us across the peninsula to the edge of the Chesapeake Bay. In a place called the Saxis Marsh, they hoped to find one or more short-eared owls working over the marsh grasses. Instead, we saw what several of us thought to be the best bird of the trip, a small bird working its way along a ditch between the road and a bushy bank. This treat was a Virginia rail and, like other members of the rail family, is not normally an easy bird to see. This individual, however, seemed not to be bothered in the least by the 11 giants standing on the road admiring it as it went about probing in the mud for such food as insect larvae, earthworms and slugs.

This handsome chap with rusty-colored plumage has black bars on its flank and a long slightly decurved bill, which can be seen in Dorothy Bordner's drawing. This rail is considered to be an uncommon breeding bird in Pennsylvania, but it can be found in local marshes. When I asked Dorothy for a drawing of the Virginia rail, as often happens she had a story to go with it. Several years ago she and another birder found a rail's nest in a nearby marsh. To their surprise the nest was concealed in marshy vegetation several inches above the ground. A few days later they went to check it again and were even more surprised to find all the eggs lying on the ground under the nest. They carefully placed the eggs back in the nest. When they checked the nest again later, the eggs were back on the ground, only this time, tiny baby rails were beginning to break out of the eggs. They concluded that the mother rail had placed the eggs on the ground both times, presumably so the hatchlings would not have to tumble to the ground.

The following day our group headed to Blackwater National Wildlife Refuge. One could hardly be anywhere on the refuge without seeing a bald eagle flying over. The bird list for the day came to over 50 species, including a variety of waterfowl and such small birds as bluebirds, titmice and Carolina wrens.



Three couples headed home from there, while we took a little more time to spend with Roana and friends before they also headed back to snow country the next day. Ted and I continued to visit good birding spots in the area including a return to Chincoteague, visits to the Assateague National seashore, the Ocean City Inlet and finally the West Ocean City pond.

All too soon, however, it was time to return to frigid Pennsylvania, but we have many fine birding memories to tide us over until spring finally arrives.

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from Farming, pg. 15

tion in Washington D.C., doing some of his work online so that he does not always have to travel back and forth, she said.

The majority of farmers work at other jobs while farming because the amount of profits varies with sustainable agriculture, according to Carolyn Sachs of Pennsylvania Women's Agricultural Network (PAWAgN). Sustainable farming may have become more of a local business in that little farms are not able to feed big cities, so profits mainly arise from suburban consumers. In Jefferson County, the average income is lower compared to other counties. This makes the price of organic foods too high for most consumers, which is one of the main concerns of Hart-Gonzalez.

Farm Aid, a non-profit organization that works to maintain and promote more family farms, found that the average age of all farmers is 55.3 years old.

"We are a bizarre generation. We're younger now at an older age. We're still kicking and looking for something else to do," Hart-Gonzalez said.

In the '60s, baby boomers were aware of the environmental problems, Hart-Gonzales said, but handled them immaturely. Now approaching the end of their careers, they are choosing to take up something that concerned them earlier in life. Other farmers become involved by continuing a family tradition of agriculture through new methods, she said.

As the number of women farmers has increased, their involvement has mainly been centered on sustainable agriculture. According to a 2004 article in *Ms.* magazine, women are the main meal providers and therefore have more concern with the foods they eat. The majority of women continue to be in control of buying the food and making the meals for their families, and that control has now spread to the actual harvesting of food.

The increased number of women working in sustainable agriculture may also in part be due to fewer requirements needed to get started.

"Conventional farming is so capital-intensive and women [are less likely to] own land, so it's harder for them to get credit, machinery," said Sachs, a professor of rural sociology at Penn State, in a quote from the *Ms.* magazine article. "But they can enter [organic] farming on a smaller scale, and it doesn't require that they use chemicals, herbicides or other production practices that are more environmentally damaging."

Hart-Gonzalez said farming does not allow for a quick learning curve. If you make a mistake one season, you have to wait until the next season to get it right.

"It is a thoroughly involving way of life," said Hart-Gonzalez. She added that she enjoys spending time in her green house, being fooled by the sound of rain or just observing her own vegetables sprouting from the ground.

"I like the fact that it is real," she said. "We want a chicken, a chicken dies. If something goes wrong, it goes really wrong until it goes right. That's what's hard about it."