



UI's waste management engineer “wrestles the tiger” of on-farm odors

Animal agriculture is every bit as complicated as life itself—and so are the odors that accompany it. Ron Sheffield, University of Idaho Extension waste management engineer, says more than 150 chemical compounds can contribute to dairy odors, but research can help Idaho dairies be “profitable, sustainable and operate harmoniously with their communities.”

The 2002 Farm Bill—for the first time ever—provides funding for examining odor-related farm problems and evaluating the technologies developed to address them. By contrast, the nation has been awash in studies on water contaminants since the 1972 Clean Water Act. That 30-year gap has left U.S. livestock producers struggling with complex challenges like these:

- A dairy producer adds copper sulfate to his disinfecting footbath to protect his cows from disease, but the compound volatilizes, killing beneficial bacteria that reduce dairy odors.
 - Another dairy producer successfully reduces the amount of water entering his winter storage pond, expecting his conservation measures to pay off in lower volumes of sludge to land-apply next spring. They do, but because the proportion of water in the pond slips below an unknown threshold, he can't keep beneficial odor-fighting bacteria alive.
- “Any one change in the process can have potentially tremendous repercus-



University of Idaho
Idaho's newest dairy cows may be cute, but they, and their elders, pose real odor challenges for dairy producers. The issue is receiving additional funding, and attention, both locally and nationally.

sions, pro or con, further down in the process,” says Sheffield. “Once a system is far out of whack, trying to bring it back under control is like wrestling a tiger.”

The difficulties are defining the problem—odor standards have not yet been set—and identifying the right solution. “Waste management systems that have cost more than \$100,000 have had to be abandoned in Idaho because they were the wrong application of technologies on the farm,” Sheffield says.

Examining emerging technologies is central to Sheffield's job. In new research facilities at the UI's Twin Falls Research and Extension Center as well as at Idaho dairy farms, he is studying ways to more effectively design manure solids separators. He is also testing other pilot- and full-scale odor-reducing technologies—including anaerobic digestion systems, which break down

manure into methane and use the methane to power boilers or diesel co-generation engines. His other priorities include:

- examining the potential for reducing phosphorus in dairy manure by chemically forcing from manure a phosphorus-containing compound called struvite; a similar process has removed 76 to 90 percent of phosphorus from swine manure at the University of Tennessee
 - coordinating a series of educational workshops for odor management planners, dairy producers, and beef producers
 - seeking funding for an odor-assessment laboratory
- developing a baseline of odor concentrations for Idaho
- advising the Idaho State Department of Agriculture and the Idaho Department of Environmental Quality as they develop state odor standards

“Idaho producers need objective, predictable ways to determine what is or is not an acceptable agricultural odor,” Sheffield says. With enough resources and time, he's confident that those standards can be set and that producers will be able to operate cost-effectively within them.

