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## Machine aims to simplify dead-chicken disposal

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Nearly every day starts the same way for David Mayer, a chicken farmer for Perdue. He rises at dawn to walk the lengths of four chicken houses, grabbing dead birds by their stiff yellow feet and throwing them into 5-gallon buckets.

On North Carolina's approximately 5,000 poultry farms, tens of thousands of birds die every day. It's simply part of raising chickens 20,000 to a house. Every year, the toll on North Carolina chicken farms easily tops 25 million carcasses, Department of Agriculture data show.

Getting rid of the dead is a smelly and time-consuming chore, and it poses an environmental threat that is rarely discussed.

On most chicken farms, the birds go into a mass grave that could pollute groundwater, an incinerator that belches putrid smoke or a compost bin that takes weeks to turn them into fertilizer. Some are trucked to landfills or rendering plants -- a risk when deadly diseases such as bird flu are spreading around the world.

Now, Mayer says he has a better way: a machine that reduces dead chickens to sterile ash without a single unpleasant odor. The process is called gasification. He is hoping the technology will catch on as poultry farming continues to grow. Chickens and turkeys are already Tar Heel farmers' No. 1 moneymaker.

He and two other farmers are trying to market the machine on a large scale.

"We've picked up a lot of dead chickens in our day," said Mayer, who has raised poultry in Martin County for 27 years. "We knew there had to be some easier way to do it."

### A mounting issue

North Carolina is the nation's fourth-largest producer of chickens for meat, behind Georgia, Arkansas and Alabama. While other states have banned burial of birds and clamped down



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### WHY CHICKENS DIE

In a state where more than 730 million chickens are produced each year, a certain number of dead birds are to be expected. Some of the common reasons chickens die are:

**STRESS:** Poultry companies breed birds to grow extremely fast, and their hearts are too weak to withstand stress. A sudden noise, a burst of exertion or even eating too fast can cause a chicken to keel over from a heart attack.

**SUFFOCATION:** If chickens become frightened, they sometimes pile on top of each other and smother. A failure in a chicken house's ventilation system can suffocate a whole house, as many as 25,000 chickens.

**HEAT:** Chickens have a high body temperature and can't sweat. They succumb easily to heat.

**DISEASE:** Avian flu has not yet been spotted in the United States, but plenty of other diseases circulate through American poultry flocks, killing weak birds. Diseases usually take three to seven days to become evident, so if a farmer transports dead birds off his farm, he could unknowingly contaminate landfills or rendering plants.

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on chicken waste, the industry here has received little attention from environmentalists or state regulators.

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Molly Diggins, director of the N.C. Sierra Club, said most attention has been focused on the explosive growth of the hog industry and its dramatic waste spills into rivers. The poultry industry has "just been overshadowed," she said.

The vast majority of waste disposal systems on chicken farms are not licensed by the state Division of Water Quality. Only lagoon-style disposal systems, used mostly on hog farms, require licenses. The state Department of Agriculture has guidelines for the disposal of dead chickens, but inspectors have no means to test whether the carcasses are tainting groundwater or streams, said state veterinarian David Marshall.

According to the guidelines, birds must be buried at least 3 feet below the surface and 3 feet above the water table. In Eastern North Carolina, where the water table is shallow, it is not always possible to meet that standard. Unless the carcasses are in standing water, an inspector can't know if a pit is legal, Marshall said.

In 2005, the state inspected 1,335 farms to see whether they were properly disposing of their dead. One farm received a warning letter and none was issued a fine, Marshall said.

Marshall said he does not see the disposal of dead birds as a major issue. "I don't think there's a glaring problem," he said.

But some farmers say they know from experience that the current disposal methods are unappetizing at best and dangerous at worst.

Darrell Sanders has more than 200,000 chickens on his Randolph County farm. He spends hours every week shoveling them into an incinerator and a giant composting bin. The two methods are smelly, time-consuming and expensive -- and in times of catastrophe, when hundreds or even thousands of birds die at once, they aren't big enough to handle the job.

"You dig a humongous ditch, and the only thing you can do is just fill it in," said Sanders, who has raised chickens for more than two decades. "Nobody wants that, but we just don't have any other way."

### **The cheapest option**

Burial is the cheapest and simplest way to dispose of birds, and many use it far more often than Sanders. It is an especially attractive option for cash-strapped and inexperienced farmers.

Mayer said the disposal pits on his farm, a couple of miles from his Halifax County hometown of Hobgood, attracted raccoons, buzzards, maggots and other vermin. And now that they are filled in, they have formed large sinkholes and made the land unusable.

His gasification machine, which he paid N.C. State University to test on chickens, solves many of the problems. Mayer didn't invent the technology -- gasification has been used to dispose of diseased animal carcasses in Europe -- but he was the first to adapt it for chicken disposal.

The gasifier looks like a large silver pizza oven, its interior lined with white fire bricks. The chickens are loaded through a door and then heated, indirectly, at about 1,500 degrees until they combust and turn to ash. At some point, the chickens give off enough gas that they begin powering the oven without the help of propane. It emits no foul odor, and clear heat vapors puff from the smoke stack.

When the process is finished four to 12 hours later, 270 pounds of chickens are reduced to about 2 gallons of dry ash.

The gasifier's air emissions are about 10 percent of those produced by an incinerator, said Preston Burnette, an NCSU engineer who researched the machine. And it uses about one-third as much fuel.

The machine comes in three models that hold 275 pounds, 500 pounds and 1,200 pounds each. In case a farmer has too many chickens to fit in the machine, it comes with a freezer that holds 2,100 pounds of birds.

NCSU is also studying gasification as a way to get rid of hog waste. Burnette said it could probably be used to burn other livestock carcasses and waste as well.

U.S. Rep. Bob Etheridge, a Lillington Democrat who sits on the House Agriculture Committee, has seen the machines in action. He was so impressed that he said he will press for more federal money to help farmers start using them. Mayer's gasifiers start at about \$27,000.

Etheridge foresees a day when all kinds of farm waste will go into gasifiers and the heat and gases they produce will be converted into energy that can be used to power farms.

"You stop burying chickens in the ground, you stop running the old incinerators that stink," Etheridge said. "I think these guys are really onto something."

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