

# Meadow Muffin Power Making A Comeback

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KANSAS CITY, Mo. (AP) - Meadow muffins, meet Reddy Kilowatt.

Let's translate that: Meadow muffins, better known as cow manure, have a future in producing electricity.

Gene Pflughoft is the economic development director for Grant County in southwest Kansas. Early next year, he said, equipment at a cattle feedlot will begin turning manure into fuel that could make electricity for 30 homes.

If the demonstration project is successful - and Pflughoft is confident it will be - larger units could be placed at feedlots to take advantage of the state's abundant supplies.

Kansas has plenty of cow manure, with two cows for every human in the state. Over the course of a year, just one cow's manure contains the same amount of energy found in 140 gallons of gasoline.

"There's a lot of interest, and it's very renewable," he said.

The Bipartisan Policy Conference in Washington - established by former U.S. Sens. Bob Dole, Howard Baker, Tom Daschle and George Mitchell - recently issued a study that said Kansas could use more cow manure by blending it with coal.

The report said that 50,000 cows could provide enough dung to power 24,000 homes.

Manure from other sources is also being used - even to make gasoline.

In Missouri, poultry farmers have approached Kansas City Power & Light about adding manure as fuel to coal-fired power plants. The utility said it was collecting information. Meanwhile, a 55-megawatt plant in Minnesota is relying on turkey droppings.

Valero Energy, a Texas refining company that can make 3 million gallons of fuel a day, is providing cash to a company that has made batches of high-octane gasoline using manure in a fermented mix.

A demonstration plant at Port Arthur, Texas, will produce 1.3 million gallons of fuel a year. Mark T. Holtzapple, of chemical engineering at Texas A&M University, spent nearly 20 years developing the process that can produce gasoline for \$1.75 to \$2 per gallon without government subsidies. He half-jokingly recommends manure futures as an investment. "I believe we will have a shortage of manure in the future," he said.

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The idea of using manure for fuel has a fickle history in the United States. Pioneers would have struggled even more on their treks out West if it hadn't been for dried buffalo chips they burned in their evening campfires. "Using animal manure was really a necessity," said John Mark Lambertson, director of the National Frontier Trails Museum in Independence.

More recently, dairy farmers in the 1970s were encouraged to install manure digesters that produced methane to run electric generators. A cow could produce enough manure to run a 100-watt light bulb for 1 1/2 days. But design problems with the digesters and cheaper energy prices thwarted the idea.

As energy prices climbed in recent years, better designed digesters at dairy farms have begun to rebound.

Although a lot of manure is used for fertilizer, interest in other uses never waned.

Kansas has nearly 100 commercial feedlots that fatten 2.5 million cows every six months. Each produces an average of 6 pounds to 8 pounds of manure a day - 7 billion pounds of the stuff a year.

No wonder the authors of the Bipartisan Policy Center's report suggested that a Kansas power plant located near some feedlots could use a blend of 90 percent coal and 10 percent manure to generate electricity.

"I wouldn't have put it in the model if I didn't think it was feasible," said Burton English, one of the study's authors and a professor at the University of Tennessee.

Of course, it's not going to be that simple. For manure to burn, its moisture content must be less than 20 percent. It must be in good enough shape not to produce byproducts such as slag that can foul utility boilers.

Even if the manure is free, there are transportation costs. And it has to be kept dry, which could require covered storage.

The Kansas power plant near Holcomb cited in the Bipartisan Policy Center's report hasn't studied the idea.

"I'm not saying it won't (happen), but at this time it's not," said Cinthia Hertel, a spokeswoman for the utility.

Many environmentalists aren't wild about manure, cringing when it's called green power. Burning manure produces carbon dioxide, a greenhouse gas. But it's considered carbon neutral because manure left to degrade also contributes greenhouse gases.

Other emissions, including sulfur dioxide and small particles, need to be captured when manure is burned. Minnesota environmental officials said there were problems with the plant using turkey droppings.

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Still, financial incentives and requirements to use more renewable energy are increasingly making biomass projects worthwhile.

The best hope for manure producing electricity now seems to be small generators.

And that's what Pflughoft, who once worked for Farmland Industries, has in mind.

The demonstration plant set to start next year is backed by Adaptive ARC and Emerald Energy. Adaptive ARC makes the gasifier that consumes the manure with an electric arc. The resulting gas is then used to generate electricity.

The manufacturer claims the gasifier is cleaner burning than incinerators. The units, which are small enough to be moved on trucks, could be placed at each feedlot and eliminate transportation costs. And the manure could be kept dry under a roof.

The generating plants would be small by utility standards in Pflughoft's plans, but they could produce enough to power 3,500 homes. "Our goal is to put one in every feedlot and hook it up to the grid," said Pflughoft.

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