

Biofuel research focuses on manure

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The race to create a better, less controversial biofuel has spawned plenty of research into a variety of potential new sources - including switchgrass, corn stalks and algae.

One goal behind the next generation of [ethanol fuel](#) is to end the debate over whether crops that could be used for food or animal feed are being converted into fuel. It's a debate that's dogged traditional ethanol, made from corn.

A team of Wisconsin researchers say they may have found an abundant and eminently ingredient for ethanol - cow [manure](#) from the state's [dairy farms](#).

Researchers at the University of Wisconsin-Madison and a coalition of state firms have been awarded \$7 million for bioenergy research that would use a manure byproduct to produce ethanol at a dairy farm in Manitowoc County, Wis.

The funding was awarded by the U.S. Energy and Agriculture departments through their joint biomass research-and-development initiative.

"We are going to change agriculture and the [dairy industry](#) in Wisconsin," said Aicardo Roa Espinosa, founder of Soil Net LLC, a biological systems technology firm that has patents for its polymer research and development.

The key is to break down manure into different fibers. One type would be used for bedding, another for fertilizer pellets, and yet another for biofuels.

"Our idea is to put a small refinery on a dairy farm," Roa Espinosa said.

"The key to all of this is the custom polymer formulas that Aicardo creates," said John Norman, professor in the UW department of [soil science](#). "He creates these formulas that allow this manure to be separated and sorts it into these different components, and these different components have value - lots of value."

Researchers hope the technology can be used on smaller dairy farms to convert cow manure into products ranging from ethanol and mulch to fertilizer pellets, said John Markley, a UW biochemist.

"This will be a source of cash for the dairy," he said.

Tom Cox, an agricultural economist at UW-Madison, says the Accelerated Renewable Energy project is rooted in novel ways of separation technologies that break down [cow manure](#) into usable ingredients for biofuels, fertilizer pellets and a peat moss replacement for cow bedding and mulch.

"It seems like the Wisconsin Idea at its finest," Cox said.

The project aims to help produce renewable energy while also helping farmers deal with the phosphorus pollution challenge created by manure management.

For dairy farms, manure has often been a source of odor that irks neighbors, and waste that pollutes and gets farmers into trouble with regulators.

"Our vision is changing the way the manure stream is managed off a dairy facility. Nobody likes what has historically been done, and that's why my company is part of this," said R.C. Ludke of Braun Electric in St. Nazianz.

"We know . . . there are concerns associated with handling manure," he said. "The way it always has been done is not going to be the way to deal with it in the future."

The four-year grant for the manure-separation and renewable-energy project will research how to improve the efficiency of the technology as well as conduct research that would allow it to be deployed at a smaller scale, on dairy farms with smaller herds, said Markley, head of the National Magnetic Resonance Facility at UW-Madison.

Roa Espinosa said some people "thought I was from Mars" when he told them five years ago that manure might just be a go-to source for next-generation [biofuel](#).

The key to the technology are the polymer formulas Roa Espinosa invented to enable the separation of the leftovers from the anaerobic digestion process into a variety of other useful fibers - some for fuel and others for fertilizer.

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