

## New technology turns manure into clean water

May 29, 2014

Imagine something that can turn cow manure into clean water, extract nutrients from that water to serve as fertilizer and help solve the ever-present agricultural problem of manure management.

Technology that has its roots firmly planted at Michigan State University is under development and near commercialization that can do all of that. And then some.

Known as the McLanahan Nutrient Separation System, it takes an anaerobic digester – a contraption that takes waste, such as manure, and produces energy as a byproduct – and couples it with an ultrafiltration, air stripping and a reverse osmosis system.

The result, or at least one of the results, is water clean enough for livestock to drink, or, at the very least, to dispose of in an environmentally friendly manner.

“If you have 1,000 cows on your operation, they produce about 10 million gallons of manure a year,” said Steve Safferman, an associate professor of biosystems and agricultural engineering who is involved in the project. “About 90 percent of the manure is water but it contains large amounts of nutrients, carbon and pathogens that can have an environmental impact if not properly managed.”

While turning the manure into clean water makes environmental sense, the team also is conducting research on how it can make good financial sense for farmers. And in some cases it could have a significant impact on the long-term viability of the farm.

“Here in Michigan we have a tendency to take water for granted,” Safferman said. “But out west, for example, where drought remains an issue, the accessibility of clean water could make the difference between a farm remaining viable or going out of business.”

The process “goes beyond a typical digester,” said Jim Wallace, a former MSU student who earned his doctorate under the direction of Safferman and William Bickert, former professor of agricultural engineering. And it does this by extracting nutrients from the manure that can be harmful to the environment and can be re-used as fertilizer.

“For example, we’re able to capture a large percentage of the ammonia that would otherwise be lost in the atmosphere,” said Wallace, who now works for the McLanahan Corp., which is working to develop the technology. “Ammonia is a negative from an air-quality standpoint.”

Currently the system produces about 50 gallons of water from 100 gallons of manure. Wallace said the goal is to increase that number to about 65 gallons.

Work on the project began about 10 years ago at MSU, under the direction of Bickert, who saw the potential of anaerobic digesting.

“It’s a success story of a university project starting with a concept and moving all the way, hopefully, to commercial fruition,” Safferman said.

It’s hoped the Nutrient Separation System will be ready for commercialization by the end of this year.

**Related Website:** [Story courtesy of MSUToday](#)

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Published on College of Engineering, Michigan State University (<https://www.egr.msu.edu>)

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**Source URL:** <https://www.egr.msu.edu/news/2014/05/29/new-technology-turns-manure-clean-water>