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A technician leads INL and DOE officials on a tour of an anaerobic digestion plant at a Gooding, Idaho, dairy. The dairy won an Outstanding Achievement in Energy for producing electricity, fertilizer and other products from the dairy's cow manure.

Two dairies win CAES-sponsored sustainability awards

By Kortny Rolston, *INL Communications & Governmental Affairs*

At first glance, Big Sky West Dairy and Brubaker Farms appear to have little in common. Big Sky West is located in Gooding, Idaho, Brubaker in Mount Joy, Penn. Big Sky dairy has 4,700 cows, Brubaker 950.

But the two farms, which are more than 2,000 miles apart, share an important trait — a commitment to cow power. Both are successfully producing electricity, fertilizer, bedding and other products from the thousands of pounds of manure their cows produce.

These Big Sky West Dairy cows are making more than milk — their manure is used to make electricity, fertilizer, bedding and other products.

That's also why they received the Center for Advanced Energy Studies/Idaho National Laboratory Award for Outstanding Achievement in Energy.

"These farms are both leaders in anaerobic digestion and have demonstrated that it can be an economically and environmentally feasible option for dairies," said Melinda Hamilton, who leads the CAES bioenergy research initiative.

The CAES/INL awards were part of a program sponsored by the Innovation Center for U.S. Dairy to "recognize dairy farms and businesses for practices that deliver outstanding economic, environmental and/or social benefit, all helping to advance sustainability of the dairy industry."

In 2011, CAES signed a memorandum of understanding with the Innovation Center to help develop sustainable farm practices and better manure management techniques, and to improve methods for turning waste into energy.

CAES researchers are focused primarily on anaerobic digestion and using digester effluents to create additional products, like algae that can produce bio-oil.

The Innovation Center's goal is to reduce the greenhouse gas emissions related to milk production 25 percent by 2020. To reach this goal, the center wants to have 1,300 anaerobic digesters in place at dairies across the country by 2020.

Meet the winners

Big Sky West Dairy, Gooding, Idaho. Dean Foods Company and AgPower Partners (DF-AP) teamed with Big Sky West Dairy to install a manure digester system financed entirely by the private sector. The project team created viable new revenue streams for digester products to deliver positive returns for the dairy producer and investors, while preserving air and water quality.

Manure from the Idaho dairy also is being used to make a byproduct similar to peat moss.

By bringing in experts to secure financing, operate the digester and sell energy to utility companies, the project eliminates the risk for the dairy producer and frees up time for farm managers to focus on caring for animals and producing high-quality milk.

Manure is combined with organic waste from a local retailer to power the digester and create 1.2 megawatts of electricity, which is sold to Idaho Power. The digester provides enough energy for approximately 900 homes. The digester also produces 55,000 cubic yards of ammonia-free fiber that is sold as landscape fertilizer and used as high-quality, no-cost bedding for the cows.

Liquids from the digester also can be applied as a natural fertilizer to crops, providing additional cost savings for the dairy.

Brubaker Farms, Mount Joy, Penn. Brubaker Farms has mastered energy efficiency and created a successful profit stream. Manure from their cows is processed through a digester system to produce enough electricity for the entire farm and approximately 200 surrounding homes. Three solar panels totaling 10,000 square feet produce an additional 130 to 150 kilowatts on sunny days.

Luke, Mike and Tony Brubaker have hosted governors at their facility, consulted businesses on energy-efficient practices and welcomed other farmers to share what they've learned.

The Brubakers' commitment to energy management started with an economic challenge — with unstable milk prices, relying on dairy production alone would not make the best business model. To turn their vision into a reality, the Brubakers met with and learned from farmers working with biogas, government agencies offering funding and guidance, local utilities buying renewable energy, and local colleges looking to avoid putting food waste in landfills.

The result? In a recent year, when the price paid to farmers for milk was especially low, Brubaker Farms made more money selling electricity than it did from selling milk.

Read more about the U.S. Dairy Sustainability Awards.

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