Dairy Energy From Acid Whey

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In the U.S., market and political forces are driving increased development of renewable energy sources. Amid this, the dairy industry has worked fast to determine technological solutions to convert the 150 gallons of acid whey created annually by the burgeoning $2 billion Greek yogurt industry into something reusable and renewable. In New York, where total yogurt production nearly tripled between 2007 and 2013, a group of dairy producers and farmers has found a way to repurpose “waste” into energy.

New York is the third largest producer of milk in the entire country, passing Idaho in 2013 by 57 million pounds. With more than 6,000 dairy farms in New York milking more than 600,000 cows, the need for mixed-waste biogas plants has increased from a demand to a necessity. The state has set a formidable example for how to develop a mutually beneficial renewable waste management program.

“The abundant milk supply in New York has spawned tremendous growth in the production of yogurt by plants located in the state, specifically in the Greater Rochester, New York region,” said Mark S. Peterson, president and CEO of Greater Rochester Enterprise. “Large scale producers like Alpina Foods and Muller Quaker Dairy, a joint venture of PepsiCo and Theo Müller Group, have established production operations in the region because of opportunity created by dairy farms.

They have also found effective ways to manage the waste generated by their products.”

One of the main products produced at these plants is Greek yogurt, requiring an environmentally friendly solution for disposing of the acid whey created daily during the production process. It takes four gallons of milk to make one gallon of Greek yogurt, so more Greek yogurt means more acid whey.

The acid whey disposal process is no small feat. To make its Greek yogurt, Alpina Foods uses approximately 500,000 to 1 million pounds of milk per week at a facility in the Genesee County Agri-Business Park in Batavia, New York. To deal with the subsequent acid whey generated through the production, the company uses an anaerobic biodigester operated by CH4 Biogas on a nearby farm in Wyoming County, New York. The company employs the digester to process 100 percent of its acid whey.

This CH4 Biogas biodigester removes between 8,000 and 16,000 gallons of waste byproducts from the 41,000-square-foot yogurt plant each day. It collects organic wastes, including the acid whey, processes them and creates the right environment for the breakdown of organic material.

Methane gas is one byproduct produced from the decomposition of the acid whey organic material. CH4’s biodigesters collect, compress and convert the gas into energy by running it through an engine. This would otherwise be greenhouse gas if emitted into the atmosphere. Instead, it is used to generate electricity that is put on New York’s power grid.

In a CH4 Biogas system, there are two byproducts that remain after methane gas is produced: a solid fiber that is used by farmers as livestock bedding and a liquid that is spread on fields as fertilizer, providing an environmentally friendly solution to handling waste. The process design and equipment used by CH4 Biogas is based on a proven technology that has been used in Europe for more than 25 years and was established by Bigadan A/S, a Danish company and CH4 partner.

While it can be a costly solution for smaller farms and dairy processors, New York state offers grant money to help establish these operations through the New York State Energy Research and Development Authority (NYSERDA). New York Gov. Andrew Cuomo has placed a strong emphasis on supporting and growing the dairy industry in the state.

The funding for these efforts stems from recommendations made at Cuomo’s Yogurt Summit in 2012 to ensure that the industry continues to grow and create jobs in New York State. As Cuomo announced in his recent State of the State address, a second Yogurt Summit will take place in 2014 to help continue the phenomenal growth of the state's dairy industry.

In January, the governor announced nearly $21 million in available funding to create new economic opportunities for New York’s dairy farmers by helping them produce renewable energy and improve their business operations. The funding will help

dairy farmers convert farm waste to energy and develop individualized business and environmental plans to reduce operating costs and increase profitability.

The need for environmentally sound disposal solutions for acid whey has created mutually beneficial opportunities for the dairy industry, yogurt producers and manufacturers of biodigesters. With tax credit and other support from the government, these industries and the earth will all reap the benefits.

Links:
[1] http://www.foodmanufacturing.com/digital-editions/2014/07/july/august-2014-farm-fromage