



Green Valley Dairy

Krakow, Wis.

Winner: Outstanding Achievement in Renewable Energy

Dairy's Natural Ecosystem the Key to Conservation

Brothers John and Mark Jacobs, first-generation dairy farmers, established Green Valley Dairy in Krakow, Wis., in 2000 with 1,500 cows. In their first year of operation, the team quickly expanded their herd to 2,500. The dairy was again looking to expand in 2005 but first wanted to improve its manure management program. The dairy's goal was to reduce its carbon footprint while adhering to sound business practices. To achieve this objective, the Jacobs integrated sustainable practices into every aspect of the dairy, while converting to anaerobic digesters and implementing underground piping for nutrient handling and application.

Today, the farm is home to 3,500 cows, 3,500 off-site young stock and 8,300 acres of cropland. Three manure digesters contain odors from the dairy, produce electricity, provide biosolids used for cow bedding and liquid by-products that fertilize crops through underground transmission pipes. During this growth and innovation, the Jacobs welcomed their sons and business partner Ken Peters to the operation, which has 35 employees.

Best Practices

1 Manage Manure

Summary

Before expanding the herd, the farm wanted to be sure it was using the most effective manure management practices available. Green Valley Dairy completed extensive research on all available technologies available to manage manure, assembled a team of experts and eventually chose to build the first of three anaerobic methane digesters. Today, the farm is home to three digesters.

Key benefits

The digester project benefits climate change strategies by reducing the amount of greenhouse gas produced by the dairy. The digester project also has allowed the farm to substitute fossil-fuel-based electricity and heating with clean, renewable electricity and waste heat from electric generators. Odor reduction and containment are additional benefits that have helped Green Valley Dairy remain a good neighbor and steward of air quality.

2 Repurpose Manure

Summary

The anaerobic digesters at Green Valley Dairy allow manure to be recycled into 98 percent pathogen-free animal bedding. The alternative bedding product goes through a second composting phase that helps to create the best possible bedding product. The liquid portion of the manure also is recycled as natural fertilizer on Green Valley's fields.

Key benefits

Biosolid bedding produced by the digester has eliminated \$245,000 in sand bedding costs annually, decreased odors and reduced emissions previously created from hauling bedding to and from the dairy. In addition, Green Valley provided cost savings to nearby dairies and landscaping companies by selling them recycled bedding for significantly less than the cost of alternatives. The liquid manure applied to fields also returns much-needed natural nutrients to the soil.

3 Reclaim and Sell Energy

Summary

Via the digester, Green Valley generates electricity in the form of biogas that can be sold to the local utility power grid, as well as reclaimed as heat for use in various areas of the dairy. The system at Green Valley is a Biogas Nord digester system that operates the three tanks in parallel to accommodate the waste stream of 3,500 dairy cows. Green energy is created for use on the farm and in the community through cogeneration.

Key benefits

The system maintains the capacity to produce 1,200 kWh utilizing two CAT 3512 cogeneration engines. The average amount of electricity a dairy of Green Valley's size would be worth is approximately \$190,050 in Wisconsin. The farm generates significant more energy than it consumes, with the majority of production going onto the local grid.

4 Recycle Water

Summary

During the digestion process, essentially all water is reclaimed and returned within the dairy's ecological system in a "reuse it, return it" approach. Inside the dairy, second- and third-use water is recycled and used in the milking parlor for cleaning and washing, and is used to irrigate crops. The dairy has 6 miles of underground piping that transports low solid nutrients to an irrigation system.

Key benefits

Due to water recycling efforts, Green Valley Dairy is pulling less from the community's water table. The piping system eliminates additional hauling and transportation emissions and also places nutrients and water back into the soil.

As one of approximately 150 dairy digesters in the United States, this project faced early market and technology barriers. Green Valley Dairy attributes much of its success to alignment of management strengths, boardroom-style initiatives and sound business decisions.

The partners are proud of the commitment the dairy made to be a good steward of the environment and adhere to their philosophy of responsible and sustainable farming. The dairy's willingness to share their experiences and knowledge with others also serves as a component of their environmental stewardship. The partners openly share research and information with the dairy industry and other operations that are seeking guidance or ideas as they venture down the path of green dairy expansions.



The Sustainability Awards are part of the U.S. Dairy Sustainability Commitment, an industrywide effort to measure and improve the economic, environmental and social sustainability of the dairy industry. The award program recognizes dairy farms, businesses and collaborative partnerships for their contributions to healthy people, healthy products and a healthy planet and showcases that sustainability makes good business sense. An independent panel of judges evaluate all nominations based on the program's or project's results as measured by triple-bottom-line success – economic, environmental and social. For more information, please visit USDairy.com/Sustainability/Awards.