IOWA FOOD WASTE REDUCTION PROJECT
Case Study

Food Displaced =WASTE

Link Energy Biodigester

Trent Linkenmeyer is the owner and operator of Link Energy in Riceville, Iowa. Link Energy is a family owned and operated farm that recently added a state-of-the-art biodigester. Their reasons for adding this 2,000,000 gallon giant are numerous. The family wanted a better controlled system to handle their farm and livestock waste in an environmentally friendly manner. Also, adding the biodigester to their farm operation would provide added income while accommodating a more community friendly operation. Finally, the added tax incentives and funding options were pivotal to the decision to go forward with building the biodigester. The Linkenmeyer family visited other farms with digesters to learn how to operate the massive giants prior to setting up their own

FEEDNG THE BIODIGESTER

The biodigester must maintain a temperature of 101 degrees Fahrenheit to properly finish digesting materials in approximately 21 days. The biodigester is maintained at this temperature indefinitely because of the towering cost of $40,000 to $50,000 to initially reach 101 degrees Fahrenheit.

FACTS AT A GLANCE

Link Energy processes about 60,000 gallons per day of waste in a system that is rated at 96,000 gallons per day.

Anywhere from 30-50 percent of the materials put into the digester is turned into methane.

Many different materials can be added to the digester. Lots of manure is digested from the Linkenmeyer farm, but also added are waste egg products and waste from the local locker and meat packing facilities. Linkenmeyer is currently looking for vegetable and fruit trimmings and other food waste to add to his biodigester. He states, "If it's good enough for us to eat, the digester will like it too."

Linkenmeyer does have to be mindful when he feeds his biodigester. When attempting to add waste products from a local tanning facility, the high salt content did not agree with the digester and inhibited the degradation process by killing the beneficial bacteria. Similar problems are encountered with food that has been clean treated with a hydrogen peroxide wash to kill germs prior to eating. These foods would also kill the bacteria that are essential to breaking down organics in the digester. Linkenmeyer noted that it is a constant experiment to feed his biodigester with no set rules.

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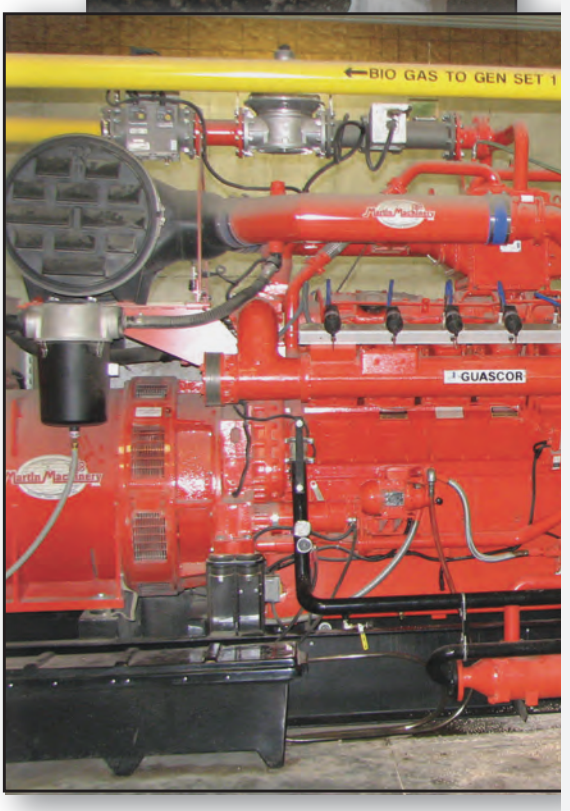
CHALLENGES

The initial start-up of this impressive operation was not without challenges. Linkenmeyer's first batch in the biodigester had a foaming issue as the family tried to find a baseline for the operation. There are also the everyday challenges of maintenance. Linkenmeyer stated that every single pump has been switched out and replaced as it takes a lot of wear on the pumps to keep all the liquids in constant suspension.

OUTPUT – WHERE IT GOES

The benefits of Linkenmeyer's biodigester are broadly significant. The harvested methane produced from the anaerobic breakdown of organics is burned in a 900 horsepower engine which, in turn, runs a 600 kilowatt generator for the farm. The electricity produced is then sold to the power company. The power company turns around and sells this electricity to customers on the power grid. Back at the farm, the waste heat from the exhaust and cooling of the engine is run through a heat exchanger to heat the building and digester.

The solid waste that remains after digesting looks like cellulose insulation and smells earthy. This product is sold to farmers in Wisconsin for use in dairy cattle bedding. The liquid waste that comes out of the digester is applied directly to Linkenmeyer's land as fertilizer. Currently, Link Energy is working towards selling extra methane as natural gas to burn in flex fuel cars and trucks.



FAR REACHING BENEFITS

Through implementing the biodigester, Linkenmeyer has been able to achieve waste reduction and efficiency during the whole process. Rather than sending waste to the landfill, he is able to turn manure and food waste into a valuable resource that is utilized by the Linkenmeyer family and the customers of a local power company. From start to finish, nothing is wasted in the biodigesting process at Link Energy.

DID YOU KNOW?

According to the United States Environmental Protection Agency (U.S. Farm Anaerobic Digestion systems: A 2010 Snapshot) 453 million kWh of energy were produced in 2010 in 162 anaerobic digesters. This is enough energy to power 25,000 average sized homes.