

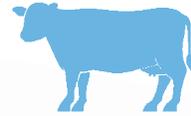
Project Profile: Patterson Farms



Complete mix digester at Patterson Farms.

Photo Credit: Cornell University

DAIRY



Auburn, New York

**Key
Features**

COMPLETE MIX



CO-DIGEST



ELECTRICITY



Highlights

- 1,900-head dairy farm operating an anaerobic digester since 2005
- Over 3 million kWh of electricity generated annually from codigestion of manure and food waste
- Additional revenue streams from food waste tipping fees and sale of carbon credits, electricity, and manure solids

Patterson Farms, Inc. is a dairy farm in central New York, owned by the same family for the past seven generations. The farm uses dairy cow manure and food waste from neighboring facilities to generate electricity.

Overview

In 2000, Patterson Farms began having odor issues related to its newly constructed, 4.5-million-gallon earthen manure storage pond. The farm attempted to control odor by mechanically separating manure solids from liquids, piping liquids to the earthen storage pond, and storing separated solids in a three-sided shed for use as livestock bedding material. This method eliminated odor issues from the solids, but the Patterson Farms desired more odor control for the liquid storage.

The dairy began researching and applying for grants, and in 2004, they partnered with developer RCM Digesters (now Martin Construction Resource) to construct an anaerobic digester for further odor reduction and improved manure handling. The digester began operating in October 2005.

“The digester helps us deal with the odor problem, and the food waste tipping fees and electricity payments generate positive cash flow for the farm.”

– Connie Patterson, Patterson Farms, Inc.

About the System



Aerial view of Patterson Farms.
Photo Credit: Patterson Farms

The Pattersons selected a 1.2-million-gallon complete mix digester due to its ability to handle influent with a low concentration of solids, as well as food waste from outside sources. The farm receives a tipping fee from Kraft Foods Inc. for whey from their nearby cream cheese factory.

Prior to digestion, the farm separates raw manure with a screw-press separator. The separated liquids are mixed with whey and food wastes and fed to the digester, and the solids are reclaimed for livestock bedding and off-site sales. A hydrogen sulfide scrubber cleans the biogas from the digester before the biogas is sent to fire two engine-generator sets: a 180-kW genset installed with the original system and a 225-kW genset added in 2009. The system produces 173,300 cubic feet of biogas each day and generates over 3 million kWh of electricity per year. The Pattersons use electricity generated from the system on site, and they sell excess power to the grid under the New York State net metering law. The farm uses waste heat from the gensets to keep the digester operating at mesophilic temperatures. The system also has a 12-inch flare, which combusts excess biogas when electricity is not being generated.

Benefits

Patterson Farms advances sustainability in the following ways:



- Protects human health by reducing pathogens in manure through the anaerobic digestion process
- Improves quality of life in the community by reducing odor on local farms



- Creates a nutrient-rich fertilizer product, which reduces the use of petrochemical fertilizers
- Offsets the use of fossil fuels in electricity generation



- Generates revenue from sale of excess energy and manure solids
- Offsets electricity costs by using power generated on site
- Generates revenue from food waste tipping fees and carbon credits

SYSTEM DESIGN PROPERTIES	
Feedstock Processed	Dairy cow manure, whey, food waste
Throughput	45,000 gallons per day of manure and 15,000-22,000 gallons per day of whey and/or food wastes
Digester Type	Complete mix
Population Feeding Digester	1,050 cows, 870 heifers
Baseline System	Storage tank or pond
System Designer and Developer	Martin Construction Resource, LLC (formerly RCM); digester cover installed by Environmental Fabrics, Inc.
Biogas Generation	173,300 ft ³ per day
Biogas Uses	Cogeneration

System Financing

Most of the funding for the original \$1.5 million digester system came from grants from the New York State Energy and Development Authority, the Cayuga County Soil and Water District, and the United States Department of Agriculture.

Recognition

The Patterson Farms project has received the following awards and recognition:

- [2012 New York State Agricultural Environmental Management Award](#) for efforts to protect the environment through preservation of soil and water quality
- [2009 U.S. EPA ENERGY STAR Combined Heat and Power Award](#) for CHP systems that have demonstrated superior performance

Want to learn more?

Cornell University provides an in-depth 2012 case study about the farm and digester system at https://ecommons.cornell.edu/bitstream/handle/1813/65753/DES_Patterson_case_study_revision_3.pdf?sequence=2&isAllowed=y.

View a video published by the NY Animal Agricultural Coalition at <https://www.youtube.com/watch?v=rWphhRuAAA>.

Visit Patterson Farms' website at <https://www.wwpfi.com/2101.html> and see recent updates on their Facebook page, <https://www.facebook.com/profile.php?id=100063533708530>.

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