

SUNNY KNOLL FARM – PERRY, NY

SYSTEM DESIGN

Sunny Knoll's primary reason for installing a digester was to offset farm electrical costs. Approximately 33,000 gallons of manure is scraped from three freestall barns each day. The manure flows by gravity into a below-ground mixing tank where it is stirred and then pumped directly into the digester.

In 2006, the farm began operating a below-grade, plug flow digester with a flexible cover. The system operates at a temperature of approximately 100°F and has a hydraulic retention time of about 18 days. Biogas is pressurized using an electric blower prior to entering a 230 kW Caterpillar G379 engine-generator set. Generated electricity is used on the farm and surplus is sold to New York State Electric & Gas. Excess biogas is burned by a gravity flare.

Cornell University completed a [Case Study](#) of the digester system.

PROJECT BENEFITS

- Odor and pathogen reduction
- Electrical savings (approximately \$14,000/mo.)
- Reduced risk of run-off and nutrient leaching
- Nutrient conversion for use as natural fertilizer

Waste heat from the engine is recovered as hot water and used for domestic hot water, space heating, and heating the digester. Excess heat is sent into the atmosphere through an external radiator.



Photo: RCM International, LLC

- **Population Feeding Digester:** 1,500
- **Baseline System:** Storage Lagoon
- **Digester Type:** Horizontal Plug Flow
- **System Designer:** RCM International, LLC
- **Biogas Generation:** 111,400 ft³/day
- **Biogas Use:** Cogeneration
- **Generating Capacity:** 230 kW
- **Receiving Utility:** New York State Electric and Gas
- **Project Funding:** USDA