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CRAVE BROS. DAIRY FARM/CLEAR HORIZONS, LLC – WATERLOO, WI

SYSTEM DESIGN

Milk cows at Crave Brothers Farm produce approximately 55,000 gallons of manure each day. Waste falls through slotted floors and flows by gravity to a collection pit where about 2,500 gallons of whey and other waste products are added to the manure from on-site cheese operations.

In 2007, the farm began operating an above-ground, complete mix, stainless steel tank digester system. The digester maintains a temperature of 99°F and has a hydraulic retention time of 25 days. Solids are separated using a screw press separator.

Crave Brothers Farm teamed up with Clear Horizons, LLC to install a digester that can be operated and monitored remotely using an Internet-linked workstation. Clear Horizons owns, operates, and maintains the digester and electricity generation equipment. In return, the company retains the rights to the separated solids and environmental attributes associated with the digester.

Biogas generated from the digester is treated to remove hydrogen sulfide and condensate and fed into an engine generator set for electricity generation. The farm upgraded from a 230 kW unit to a 633 kW unit in 2009. Electricity is used to power the digester, and Clear Horizons sells the excess to We Energies, Inc. Heat from the engine generator set is collected and used to heat the digester, substrate tank, pumping, and separation rooms. Clear Horizons owns a portable boiler that is available when the engine generator set requires maintenance or repair.

The farm buys solids back from Clear Horizons for use as bedding and keeps nutrient-rich liquid for land application. Clear Horizons manufactures a trademarked Energro potting mix. Sales from Energro potting mix and bedding back to the farm account for approximately two-thirds of the income generated from the digester.

PROJECT BENEFITS

Crave Brothers Farms

- Odor reduction
- Treatment of cheese waste
- Minimal investment

Clear Horizons

- Digester can be operated remotely, reducing operating costs and maximizing the long term rate of return
- Electricity generation
- Revenue from sale of potting mix and farm bedding (accounts for two-thirds of the income generated from the digester)



Photo: Crave Bros. Farm

"When you're handling many millions of gallons of manure, any way to handle that risk is helpful. What is in this for us is manure management, odor reduction, and a chance to move the operation forward using modern technology."

—Charles Crave
Bookkeeping/Feeding Management
Crave Brothers Farm

- **Population Feeding Digester:** 1,900
- **Baseline System:** Storage Tank or Pond or Pit
- **Digester Type:** Complete Mix
- **Co-Digestion:** Cheese Plant Waste
- **System Designer:** Clear Horizons, LLC
- **Biogas Generation:** 223,000 ft³/day
- **Biogas Use:** Cogeneration
- **Generating Capacity:** 633 kW
- **Receiving Utility:** WE Energies, Inc.