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# BALDWIN DAIRY – BALDWIN, WI

## DAIRY FARM IN WISCONSIN – A GROWING DIGESTER EXPERIENCE

### SYSTEM DESIGN

Baldwin dairy produces approximately 35,000 gallons of manure and water daily. The waste is scraped three times each day and preheated using recovered heat from the boiler. It is then fed into the digester six times a day for biogas production. The digester is a modified plug flow design with liquid jet mixing. Activated sludge from the last stage of the horizontal digester is injected into the first stage of the system to enhance digestion efficiency by adding active bacteria. The operating digester temperature ranges from 95 to 100°F and the hydraulic residence time of the manure is approximately 21 days.

The system produces about 130,000 ft<sup>3</sup> per day of biogas. The biogas is used as boiler fuel to heat the digester and the excess is flared. Digester effluent generates 20-30 tons of biosolids per week. The farm uses 80 percent of the solids for on-farm bedding and sells the rest to neighboring farms.

### PROJECT BENEFITS

Baldwin Dairy Farm's digester project includes the following benefits:

- Odor reduction
- Prevented release of methane into the atmosphere
- Revenue from sale of excess bedding materials

The farm is evaluating plans to build a biogas pipeline from their operation to feed biogas into an upgrading facility close to a natural gas pipeline. Baldwin Dairy is also constructing a greenhouse complex to use biogas for heating. The farm is considering growing algae for biodiesel production or raising tilapia (i.e., an edible fresh water fish with the ability to thrive in warm, nutrient- rich water). The dairy anticipates using biogas for heat and possibly future electricity generation. Baldwin Dairy is featured in the 2009 Wisconsin Agriculture Casebook.



Photo: Agri-Waste Energy, Inc.

- **Project Type:** Farm Scale
- **Animal Type:** Dairy
- **Population Feeding Digester:** 1,050
- **Baseline System:** Storage Lagoon
- **Digester Type:** Modified Mixed Plug Flow
- **System Designer:** Komro International, LLC
- **Biogas Use:** Boiler/Furnace Fuel
- **Generating Capacity:** 200 kW