

# OWNER PERSPECTIVE: REINFORD FARM



# Farm Background

- ▣ Located outside Port Royal, PA in Juniata County
- ▣ Established in 1991 with 57 cows
- ▣ Currently 440 Lactating Cows & 30 Dry Cows
- ▣ Crop 900 acres
- ▣ Raise their own heifers

# Digester Basics

- ▣ RCM Complete Mix Digester
  - Operating since February 2008
  - Sized for 1,000 cows
- ▣ Cat 342 Engine w/ 130 kW single phase generator
- ▣ H<sub>2</sub>S Scrubber
- ▣ Auto Flare
- ▣ Screw Press Manure Separator





# Digester Inputs

- ▣ Manure from 470 total cows
  - Auto alley scrapers in main freestall
  - 2<sup>nd</sup> freestall and dry cow barn is skid steer scraped into gravity pipe



# Digester Inputs

- ▣ Other products going in:
  - Food waste (receiving a tipping fee)
    - ▣ Working with Team Ag to incorporate into Nutrient Management Plan
  - Have put in feed refusals, caused crusting issues





# Digester Inputs

- ▣ Wash water from milkhouse and parlor handled separately



# Outputs

- ▣ Electric
  - Max at 140 kW plus flaring some gas right now
  - Selling to PPL





# Outputs

- ▣ Manure Solids
  - Using on-farm for bedding
  - Plus selling to 2 other farms
  - Use about 1/3 & sell the other 2/3





# Outputs

- ▣ Waste Heat
  - From engine coolant & exhaust



# Waste Heat Uses

- ▣ Heat House
  - Hot water base board
  - Still have original oil boiler in house for back-up of entire system



# Waste Heat Uses

- ▣ Heat Shop
  - In floor radiant heat in shop floor
  - Shop is used for storage of feeding equipment in winter





# Waste Heat Uses

- ▣ Hot Water in Parlor
  - Replaced an oil fired boiler using about 200 to 250 gallons of fuel oil per month



# Waste Heat Uses

- ▣ Hot air off engine room to heat main parlor & special needs parlor





# Waste Heat Uses

- ▣ Grain drying
  - Hot air off engine radiator is piped to grain bin fan
  - Air temperature is controlled with manual slide at bin





# Waste Heat Uses

- ▣ Pasteurize Milk for Calves
  - Heating pipes inserted in bottom of used bulk tank



# Waste Heat Uses

- ▣ Still have heat to use if more ideas come along
  - One may be drying solids for bedding



# Conclusions

- ▣ The digester has been a positive addition to Reinford Farm
  - Has created additional income opportunities for the farm business
  - Reduced odor from manure
- ▣ Still have room for growth:
  - Cows numbers
  - Additional input products
  - Waste heat uses



# More Information

PENNSTATE



## Biogas and Anaerobic Digestion

Department of Agricultural and  
Biological Engineering

Basics of Anaerobic Digestion

Terminology

Types of Anaerobic Digesters

- \* Complete Mix
- \* Plug Flow
- \* Covered Lagoon
- \* Other Types or Modifications

Case Studies

Common Digester Misconceptions

Consultants, Equipment Dealers and  
Funding

Safety with Biogas

Resource Links

Centralized Digesters

DSH Digester Projects

## Biogas Production

Biogas production using anaerobic (oxygen free) digestion is a biological treatment process to reduce odor, produce energy and improve the storage and handling characteristics of manure. A biogas production system must be specially designed and requires regular attention by someone familiar with the needs and operation of the digester. Associated manure handling equipment and gas utilization components are also required. The digester does not remove significant nutrients and requires an environmentally responsible manure storage and handling system.

A well designed and operated digester will require modest daily attention and maintenance. The care and feeding of a digester is not unlike feeding a cow or a pig; it responds best to consistent feeding and the appropriate environmental (temperature and anaerobic- oxygen free) conditions. The earlier a problem in operation is identified the easier it is to fix and still maintain productivity.

**Thinking about a digester for your operation?** Ask yourself these questions.



Support for this website made possible by:

□ Case Study at <http://www.biogas.psu.edu>

# More Information

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