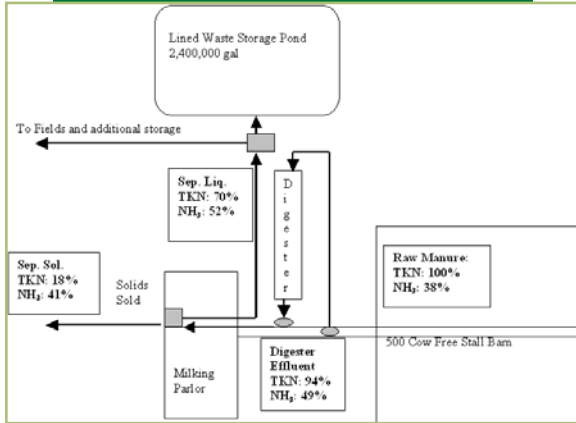


ANAEROBIC DIGESTION EVALUATION AND OPTIMIZATION OF FIVE MANURE DIGESTERS IN NEW YORK STATE

DATA COLLECTION AND EVALUATION

Information describing the project farms and systems will be organized so that farms know how existing projects fit their specific situation. This kind of information includes:

- Flow diagrams with planned material balances
- Major equipment design parameters and specifications
- Number of animals
- Digester volume
- Hydraulic retention time (HRT)
- Bedding type, amount and characteristics
- Other amendments: washwater, food waste, feed waste



AA Dairy Change in ammonia in manure treated with anaerobic digestion

In order to size and select the components of a planned system, and effectively deal with the effluent, the characteristics of the influent, effluent, and percent change of each of these components needs to be estimated.

Having the following values from these projects will help calculate values in future projects:

- Mass flows
- Total Solids (TS)
- Total Kjeldahl Nitrogen (TKN)
- Ammonia
- Total Phosphate (TP)
- Orthophosphate

The expected gas, electric and heat production is needed to estimate the size of the gas utilization system, as well as the benefits which would help offset the costs. The information being collected for this includes:

- Engine type
- Energy (kWh) generated
- Biogas Production (gross)
- Energy (Btu) to heat digester
- Outside ambient temperature
- Digester temperature

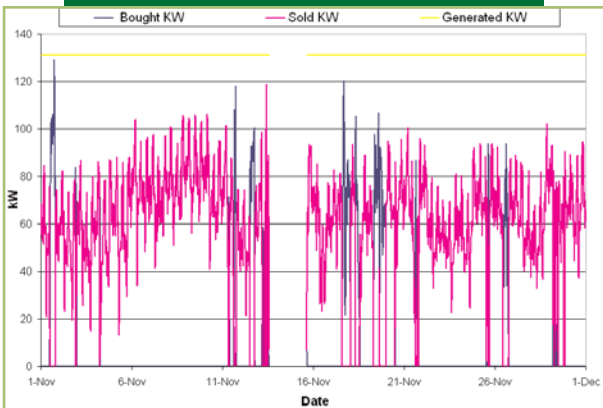
Potential pathogen reduction can be a benefit when using digested solids for bedding, and for application to cropland in sensitive areas. Measuring reductions in pathogens will help in evaluating uses for digester outputs.

Microorganisms tested include:

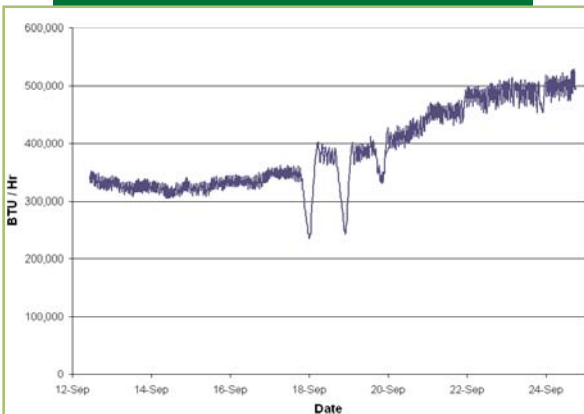
- Fecal Coliform (indicator)
- *Mycobacterium avium paratuberculosis* (Map)
(The organism that causes Johnes disease.)

Economic data is vital to show the actual capital costs and operating costs of a system. The potential value and quantity produced of value-added products such as electricity, gas, heat, digester slurry, separated solids, and composted solids are all important for projecting profitability. Raw data sources are being recorded to track these variables and calculate profitability, including:

- Capital investment
- Electric cost savings and revenues
- Heating cost savings
- Savings in bedding purchases
- Operating costs (eg. oil changes, repairs).



Matlink Dairy Farms Kilowatts generated, bought, and sold, November 2003.



Dairy Development International Anaerobic digester heat used, September 2003.

