

# *Methane Digester and Energy Production*

*Neil Moseley*

*April 15, 2005*

## **Objective:**

Resolve manure management and energy cost problems for Infinity Pork.

### ▪Facility

- 2,800 sow operation located in southern Tippecanoe County
- 8,000 finishing hogs in 16 barns measuring 40' x 165' with 2' pits
- Over 4 million gallons of manure produced annually at finishing site

### ▪Problems

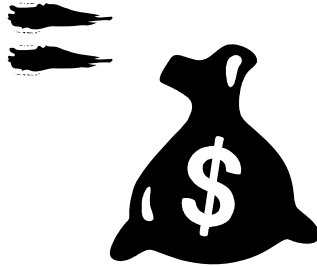
- High solids content in the pits causing plugging
- Dilute nutrient concentration of the manure is expensive to ship
- Increasing cost of energy



## Solution: Design a layout for installing a methane digester

•Cooperative designing process with:

- Hunter and Associates
- Cinergy/PSI
- Indiana Department of Environmental Management



## Digester Principle

### Natural Bacteria Process

- Acid-Forming Bacteria consume the organic material of the manure
- Biogas is produced from other bacteria that consume the acid produced by the other bacteria
- The biogas is collected in a covered tank and feed into a generator
- The process is accelerated by adding heat to the system that is collected from the generator

## Digester will be combined with a Kason Separator

- Separator use a vibrating screen to move the solids to outside of the machine and liquids move through the screen
- Allows for a flow of about 15 gallons per minute
- Reduced solid matter allows for liquid recharge of the buildings for clean-out
- Located inside of post-frame building to allow for drying of the solids



## Autothermal Thermophilic Aerobic Digestion

### ATAD Benefits

- Elimination of pathogens
- Low space requirement
- High throughput rate
- Automatic controls can easily be added

### Project Hopes

- Improve air, water, and soil quality
- Produce a pathogen-free end product for sale
- First commercial operation of this technology in swine facilities

## Digester Perfect for Infinity Pork?

### Financial

- Opportunity to produce electricity to offset over \$20,000 in annual expense
- Ability to sell excess energy to Cinergy
- Receive green energy credits
- Ability to sell by-product commercially
- Ability to use existing structures to offset investment in existing management system

### Environmental

- Concentrated nutrient stream
- Odor Reduction and Air Quality Improvement

## Special thanks to...

Jim Moseley  
Kurt Hunter  
Carl Nissawa, P.E.  
William Newland  
Dragan Macura  
Dan Bruggen  
Jim Lefeld  
Tom Bailey  
Jim Lemke  
Mark Musick