Swine Digesters
commercial, scalable, operating

RCM Digesters, Inc.
Berkeley, CA
(510) 834-4568
mmoser@rcmddigesters.com
RCM Digesters, Inc.

- Digesters are our only business
- 20 years of design, construction, operation
- More than 55 digesters operating
- About half of the digesters operating in the US are RCM Digesters
New Horizons Dairy, 2000 Cow Digester Elmwood, Illinois

New Horizons Dairy, Elmwood, IL
Biogas since October 2002

RCM Digesters, Inc
rcmdigesters.com
510-834-4568
Why Farm Digesters?

THE ONLY INVESTMENT IN MANURE WITH ECONOMIC RETURNS

- Usable and Saleable products
  - Electricity
  - Heat
  - Improved handling
- Environmental Benefits
  - Reduced odor from storage AND field application
  - Improved nutrient manageability
What Digester Goes Where?

- Depends on
  - Type of farm
    - 1, 2, or 3 site production
  - Site operation
    - Continuous Flow
    - AIAO
  - Climate
  - Manure collection method
  - Water usage
    - Water takes up space, makes no gas
Digesters for Swine Manure

Operating
- Covered Lagoon
- Complete Mix Tank
- Complete Mix Lagoon

Experimental
- Attached Media
- Anaerobic Sequencing Batch Reactor
RCM Cover on Lagoon Digester

Biogas for engine and flare since October 1993

Martin Farms
S. Boston, VA
600 Sows
farrow to feeder

rcmdigesters.com
Covered Lagoon Characteristics

- ANY AMOUNT OF WATER
- ANY PIG PRODUCTION FACILITY
- FLUSH OR EXCESS WATER USE
- Typically dilute manure with < 2% solids
- Usually warm climate - No heat added
- HRT > 30 days
- Biogas production varies seasonally
- Often flare for odor control
Cat 3406, boiler – Barham Farm
RCM Covered Lagoon Digester

Biogas  July 2002  Corneche, Chile
Odor control flare  102,000 finish hogs
Odor Control Flare Station

Corneche, Chile

RCM Digesters
Complete Mix Characteristics

- ANY PIG PRODUCTION FACILITY
- PULL PLUG, CONTROLLED WATER USE
- Manure collected with 3-8% solids
- Heated to 100 degrees
- Agitated to promote bacterial growth
- HRT > 12 days
- Steady gas output
RCM Tank Digesters

To Optimize Net Energy Production with cogeneration
RCM Complete Mix Digester

Biogas and Electricity
1986-1995
rcmdigesters.com

DJ Acres
7 Valleys, PA
15,000 Pigs - farrow to finish
RCM Complete Mix Digester

Biogas and Electricity since January 1989

Tohoku Farm
Aomori, Japan
30,000 Pigs farrow to finish

rcmdigesters.com
RCM Complete Mix Digester

Kazuno Farm
Hachinohe, Japan
21,000 Pigs - farrow to finish

Biogas and Electricity since October 1989

rcmdigesters.com
Caterpillar G342 - 120 kW

Kazuno, Japan  1989
RCM Digesters
rcmdigesters.com
RCM Complete Mix Digester

Biogas and Electricity since July 1999

Swine USA Thayer, IA

5,000 sow - farrow to wean

rcmdigesters.com
RCM Complete Mix Digester

Biogas and Electricity since October 1999
rcmdigesters.com

Colorado Pork LLC
Lamar, CO
5,500 sows - farrow to wean
Cat 3306 – Colorado Pork
Wyoming Premium Farms, Wheatland, WY
4,500 sows, farrow to wean

Biogas Since December 2003
75 kW Generator
RCMDigesters.com
RCM Complete Mix Digester

Gypsy Hill Farm - Lancaster, PA
4,000 Pigs and Whey
Biogas and 120 kW since 1983
Original: Energy Cycle 1983
RCM: redesign, rebuild, increase capacity 2000
Kluthe Farm– Dodge, NE, 2006
8,000 finish hogs, 70 kW,
RCM Complete Mix Digester

Wyoming Premium Farms
Wheatland, WY
18,000 finishers

Biogas Since June 2004
160 kW Generator

RCMDigesters.com
RCM Heated, Mixed, Covered Lagoon

To Optimize Treatment and Reduce Investment with a boiler and flare
RCM Heated, Mixed, Covered Lagoon Digester

Biogas and Hot Water since May 1998

Apex Pork, Inc.
Rio, IL

8,000 Finish Hogs
All in - All out

RCM Digesters
rcmdigesters.com
Biogas and Hot water
Since January 2001
RCM Digesters
rcmdigesters.com

Agricola Super Ltda
Chile, South America
120,000 Finish Hogs
RCM Heated, Mixed, Covered Lagoon Digester

Biogas and Hot water
Since January 2003
RCM Digesters
rcmdigesters.com

La Estrella, Chile
137,000 Finish Hogs
RCM Heated, Mixed, Covered Lagoon Digester

Biogas and Hot water
Since February 2003
RCM Digesters
rcmdigesters.com

Pocillias, Chile
238,000 Finish Hogs
20 MBTU Biogas Boiler – Pocillias
More Biogas Use Examples

Harlan Keener Flare
Lancaster, PA
Cat 3306 – Langerwerf Dairy
Continuous @ 45kw for 21 years
Cal Poly Experimental Turbine
Digested Liquids for Fertilizer
Digester SYSTEM Success

- Success comes from experience
- The digester is only 1/3 of the system
- Reliability comes from proper design, equipment specification and construction
  - RCM Digesters are most impossible to kill
  - Generators have a operating factor > 80%
  - Good systems have low O&M (avg 30 min/day)
RCM Keys to Economic Success

- Build cost effective digester
- Negotiate a profitable utility contract
- Sell it all, liquids, solids, fertility
- Take or sell all tax advantage
- Run it all the time
Manure and food waste?

- Food waste is typically highly biodegradable
- Digesters degrade highly biodegradable materials in a controlled fashion and the effluent doesn’t smell, support flies or vermin.
- Farm digester manure is a complete substrate
- Food waste may need nutrients from manure to enhance degradation
Patterson Dairy, Auburn, NY, 2005, 1200 cows and whey, 200 kW, up to 500,000 ft³ of gas/day, big flare, solids
Mead, Nebraska –
28,000 beef plus Ethanol Stillage
What RCM Digesters does:

1. Budget Prices
2. Feasibility Study
3. Design and equipment supply
4. Turnkey construction