

Feasibility Studies

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Acknowledge
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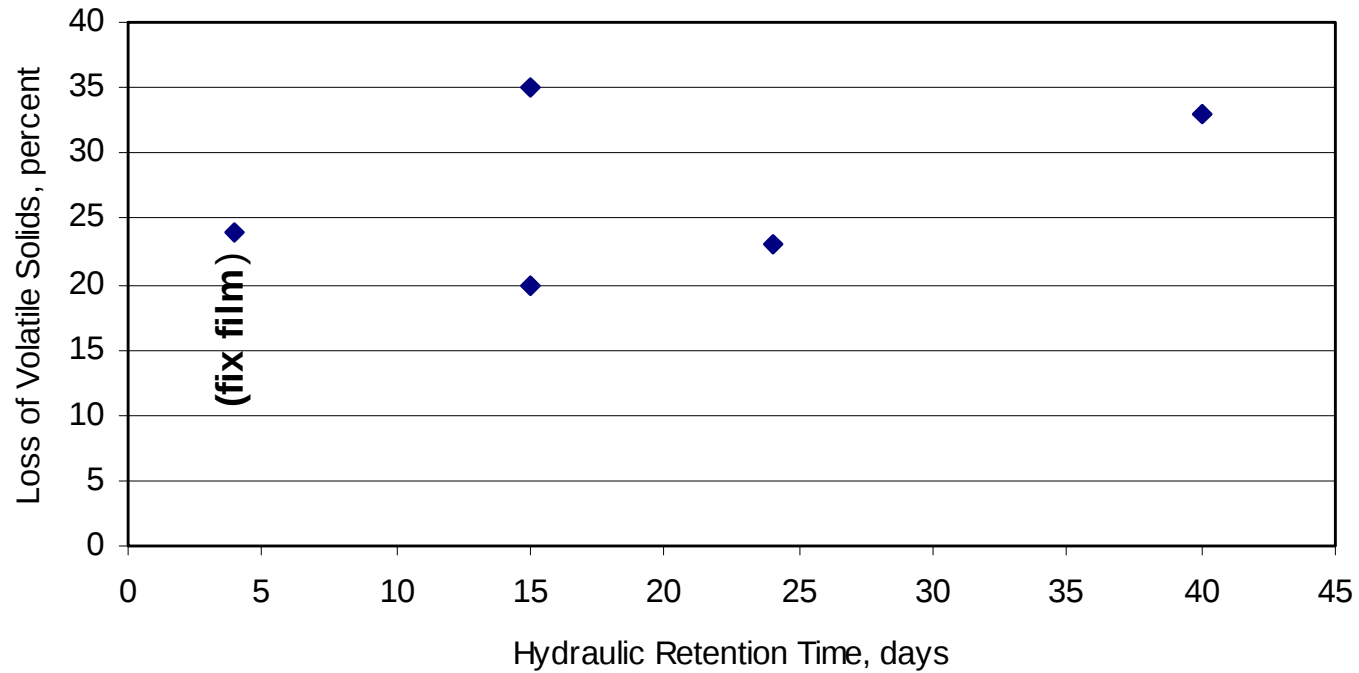
Determine Goals of New Manure Management System

- Reduce odors released during land application or at farmstead
- Develop a sustainable source of bedding
- Reduce total farm energy costs
- Expand the opportunities for managing nutrients
- Develop other sources of revenue

Some Important Parameters (Little Hard Data)

- Manure Production
- Frozen Manure (type of animal housing)
- Hydraulic Retention Time
- Destruction of Volatile Solids
- Gas Production
 - Heating digester
 - Fuel for engine
 - Other uses

Loss of Volatile Solids



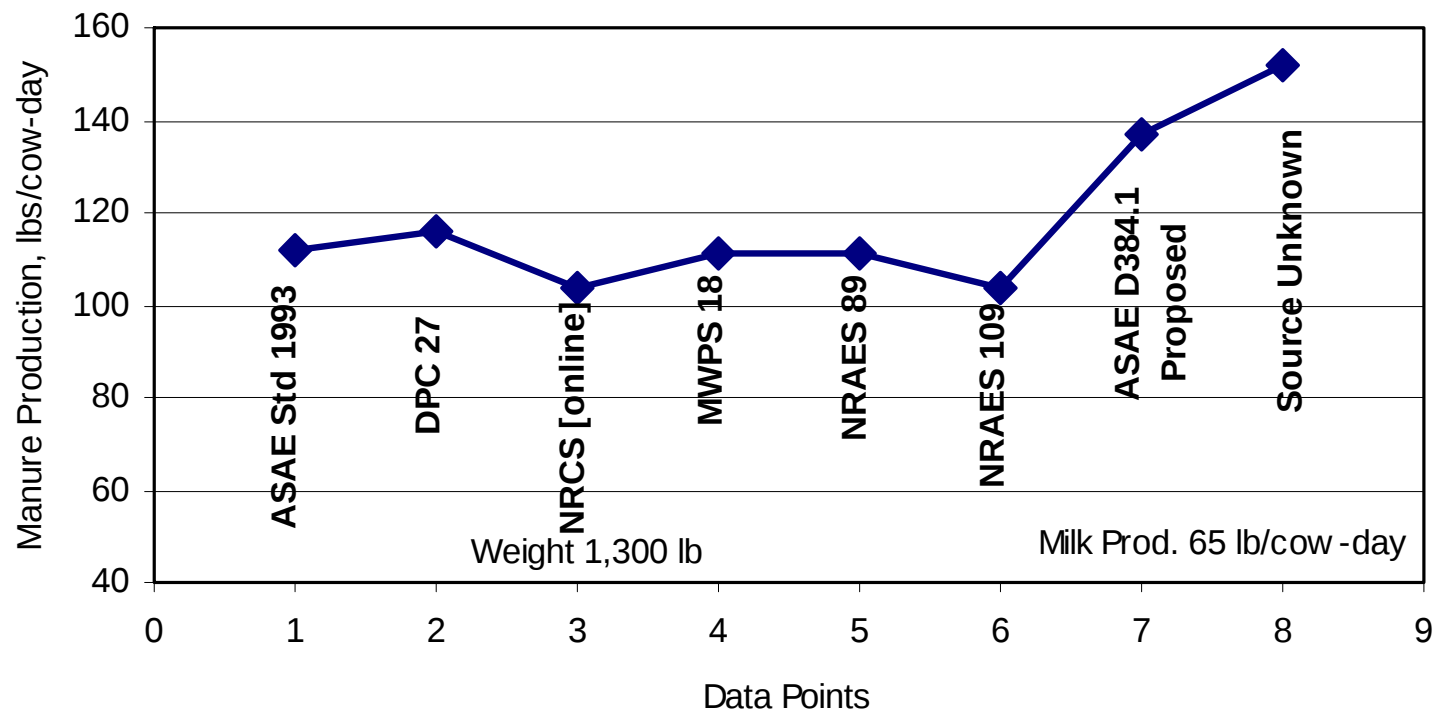
Parameter, con't

- Digester
 - Length – Width – Depth ratio
 - Percent above grade/below grade – bed rock
 - Presents of a water table
 - Cover
 - Insulation
- Bedding – composting
 - Composter type

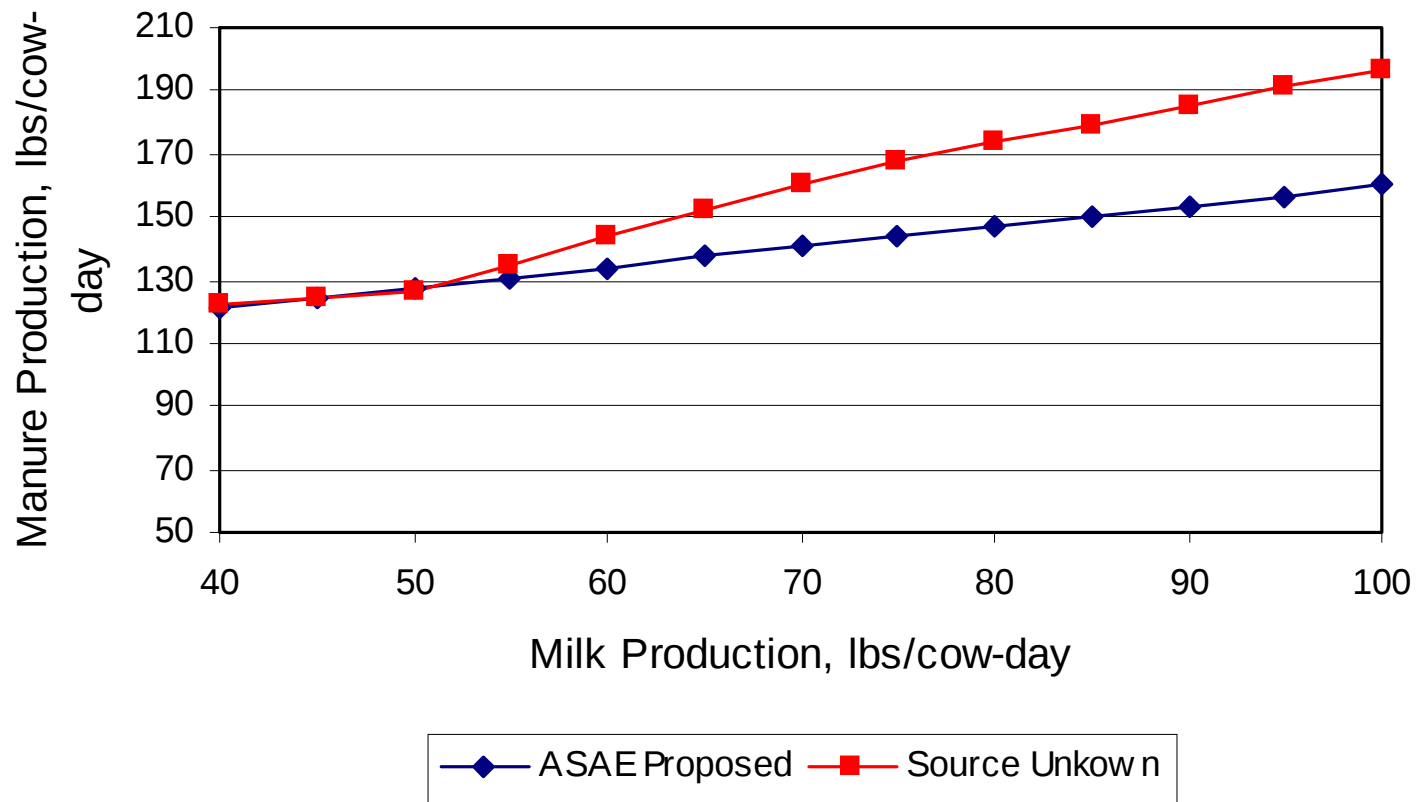
Parameters con't

- Engine/Generator

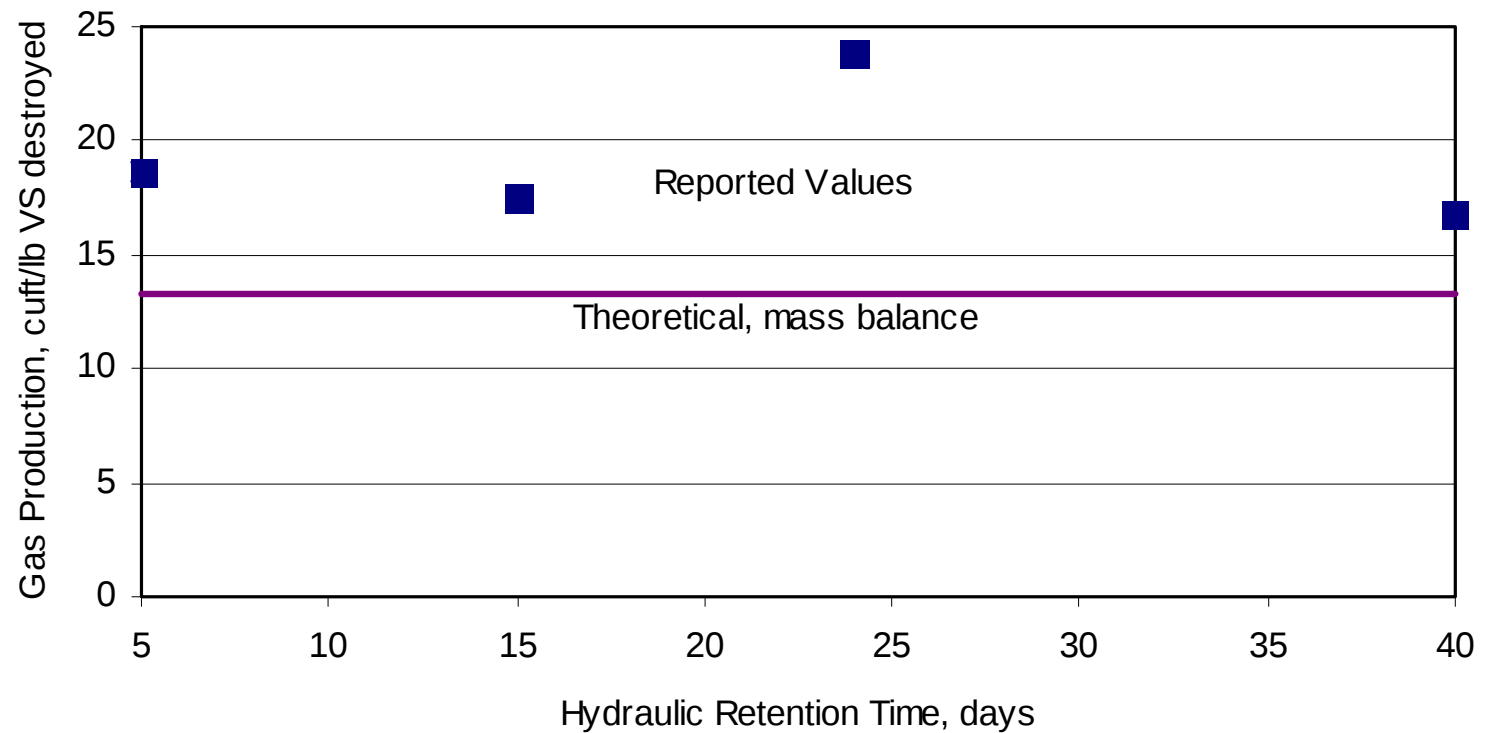
- Size (kW or kVA) Biogas available
- On-farm use or sell electricity
- Type of engine
- Efficiency vs loading
- Maintenance costs (actual)



Dairy Manure Production



Dairy Cow Manure Production

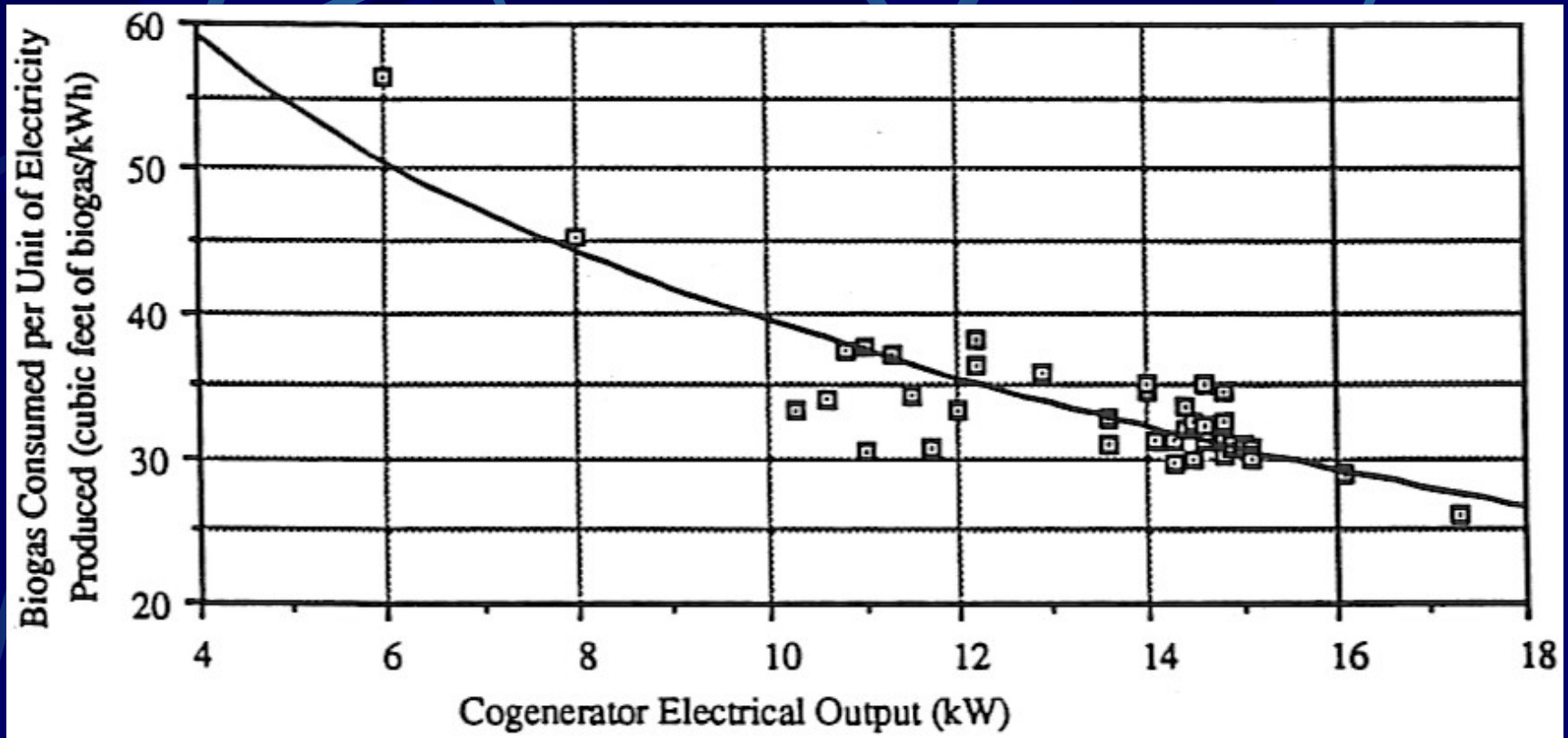


Gas Production

Volatile Solids “Destroyed or Lost” (A Mass Balance)

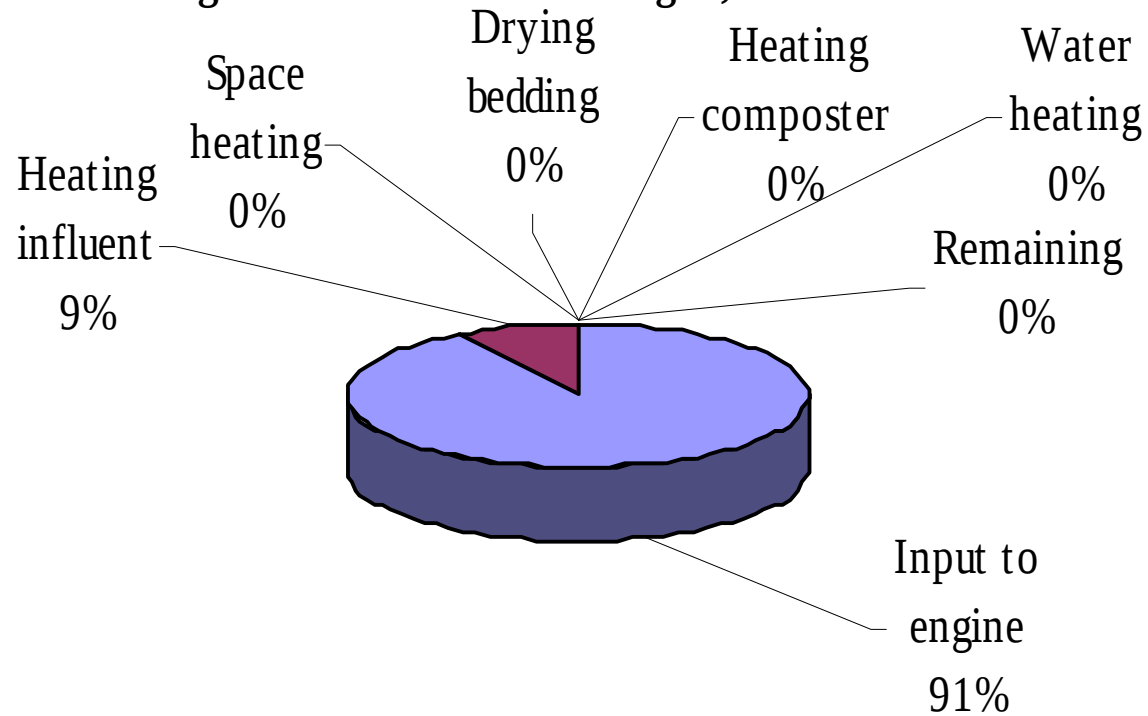
<u>Digester Influent</u>		<u>Percent</u>	<u>Lbs/day</u>
Total Solids		4.93	707
Volatile Solids		67.6	478
Fixed Solids			229
<u>Digester Effluent</u>			
Total Solids		3.92	562
Volatile Solids		63.7	358
Fixed Solids			204
<u>Solids "Lost"</u>			
Volatile			120
Fixed Solids (settled)			25
Volatile Solids >> Biogas			< 120

Efficiency of a Generator



16 kW Generator Agway Farm

Fig. 4 Distribution of Biogas, Scenario 1



**Fig. 5 Distribution of Water Jacket Energy,
Scenario 1**

