

# ANAEROBIC DIGESTION

## Fundamentals of Anaerobic Digestion of Dairy Manure

### ADVANTAGES

- Reduction of manure gas odor; Less odor allows a farmer to be more flexible regarding how manure is stored and land applied.
- Reduction of greenhouse gas emissions; This is good for our environment and further justifies farmers are good environmental stewards.
- Improvement in utilization of manure nutrients; Effluent from digesters can be stored long-term without significant odor problems, allowing farmers to apply nutrients to field crops with less environmental impact.
- Improvement of water quality; Agronomically preferred application time also coincides when predicted runoff and leaching is minimal, thus minimizing contamination to receiving water bodies.
- Generation of energy; Produced biogas can be used to generate electricity, heat water or any number of other alternative uses that can be used on or off the farm.
- Revenue potential; Besides reducing the on-farm energy costs for electricity or heat, the digester can facilitate other enterprises such as digested manure solids sale as compost or bedding, excess electricity sales, or co-digestion of food waste for a tipping fee.
- Pathogen reduction; Research has shown a 99.9% reduction of indicator organisms (those that are commonly used to evaluate the success of a system's performance relative to killing other pathogens). Johnes disease, a common disease found in today's dairy cows, is reduced 99% by digestion.

### DISADVANTAGES

- High initial capital cost; However, multiple economic analysis have shown that substantial payback is possible on some farms resulting in a net positive investment.
- Daily attention required by trained personnel; A designated farm employee must be trained in the principles and management of the system to ensure its success.
- Lack of experienced designers; A limited pool of designers with qualified credentials currently exists. However, with the recent surge in farmer's interest, more technical support is becoming available to do design and management work.

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Energy production from digesters can save energy costs on the farm.



Odor control is one of the most important advantages of anaerobic digestion.

“Anaerobic digestion is the one odor control method that has the potential to generate profits for the farm.”

- Curt Gooch  
PRO-DAIRY

