

Myths, Legends, and the Truth Surrounding the Anaerobically Digested Residuals Market



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Manure-induced CAFO Issues

- Odor
- Dust
- Runoff
- Leachate
- Methane
- Ammonia
- Vector (flies)
- Land base
- Bio-security
- Public relations
- Export of surplus nutrients
 - Ability to expand herd
 - Dairy nutrient needs
 - Hydrogen Sulfide
 - Liquid handling
 - Solids handling
 - Economics
 - Permitting
 - Transport

A.D. Myths (and Legends)

Myth: Anaerobic digestion solves manure problems

Actual: Anaerobic digestion is a good part of an overall manure plan

Myth: Anaerobic digestion will make me rich

Actual: Anaerobic digestion can offset costs and possibly generate revenue

Myth: Anaerobically digestion makes manure go away

***Partially True: You only hope anaerobic digestion makes manure go away.
Actually True: Anaerobic digestion decreases manure bulk density (weight per volume), but doesn't significantly affect overall manure volume***

Myth: Digested manure doesn't smell

Actual: Digested manure still smells; it just smells different

Myth: Digested manure isn't manure anymore

Actual: Digested manure is partially treated, but is definitely still manure

DEC finishes manure spill cleanup

Linda Ober / The Citizen; Thursday, July 19, 2007 6:48 PM EDT

(Excerpted from source: http://www.auburnpub.com/articles/2007/07/19/news/latest_news/latestnews03.txt)

... Officials with the state Department of Environmental Conservation finished cleanup operations at Twin Birch Dairy Farm Thursday, following a manure spill that occurred the evening of July 9, 2007.

...the DEC has estimated that a maximum of 25,000 to 30,000 gallons of liquid manure was spilled, Carlton said.

...people at a nearby golf course first noticed the leak.

...Dirk Young, owner of Twin Birch, said that he didn't know if his dairy would receive any fines. "I would suspect there will be," Young said Wednesday. "Hopefully, it will be minimal because we did everything we're supposed to."

...**the spill occurred when an anaerobic digester pipe pumping manure** from a storage tank to a lagoon burst. "There was really no particular reason why it broke that we know of. It just failed," Young said of the nine-year-old pipe.

...The pipe broke right by a diversion ditch, 100 yards away from a stream, the worst place for the accident to occur, Young said. "It was a worst-case scenario..." he added.

...About 80 fish were found dead in the area since the spill, which occurred in the Owasco Lake watershed, Carlton said.

Primary Factors Driving Manure Biogas

Dairy

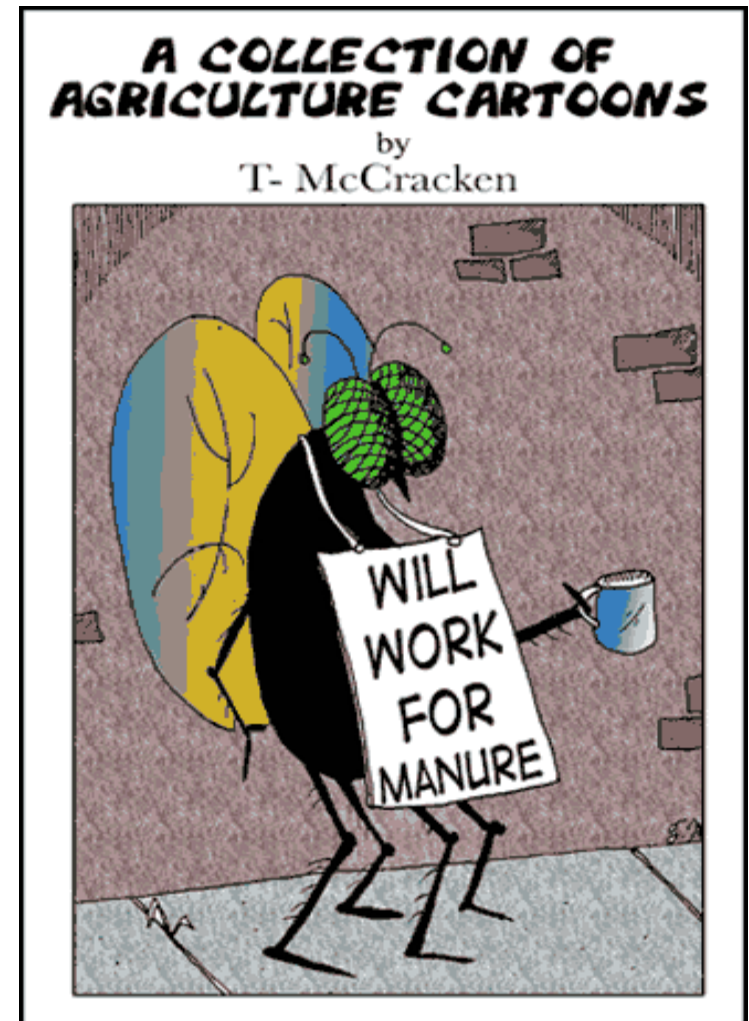
- More consistent manure management
- Potential economic upside
- Too many cows for too little land
- Pressure from suburbanization of dairy land
- Tax credits
- Desire for better animal health
- Public relations tool

Neighbors

- Less odor, flies, etc.
- Improved and better protected groundwater
- Preserved property values

Public entities

- Decreased pollution, or perceived pollution
- Renewable energy initiatives, etc.
- Regulatory pressure from governments
- Air, water, soil quality issues



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Facts About Biogas Production And CAFOs

Anaerobic digestion does address

- Methane reduction
- Solids reduction
- Manure *tonnage* reduction
- Consistency of end material
- Tax credits
- Renewable initiatives
- Digester carbon credits
- In- digester odor reduction
- Effluent viscosity

Anaerobic digestion doesn't address

- Significant nutrient reduction
- Liquids reduction
- Manure *volume* reduction
- Market for end material
- Residuals handling labor
- Ammonia reduction
- Land nutrient overloading
- Fiber carbon credits
- Post-digester odor reduction
- Residuals permitting
- Runoff / Leachate
- Vector (flies, beetles, etc)
- Dust / Particulate
- Reintroduction of pathogens
- Peat carbon offsets

What A.D. Really Does To Manure?

Speeds up, contains and manages the manure decomposition process, releasing gas in the process, including methane, CO₂, H₂S and others.

Consolidates the handling process to a centralized location.

Manages pathogens and potential weed seeds found in manure.

The process produces two residual streams: gas and slurry

- **Gas is segregated and treated for highest value uses.**
- **Slurry is usually separated into two separate, partially processed residual streams: a mostly-liquid stream and a mostly-solid stream.**

Mostly liquid stream



Composed of less than 2% solids that is concentrated with nutrients.
Is recycled on dairy to use in dairy flush, fertilization, and digester process
Exported as value added liquid fertilizer or 'tea' type product

Mostly solid stream



Composed of more than 20% solids that are mostly fibrous.
Is recycled on dairy to use as bedding, soil amendment and 'fertilizer'.
Exported as value added soil amendment

Conclusions

- Anaerobic digestion is an excellent tool for addressing the issues surrounding dairy manure management.
- Anaerobic digestion does not necessarily solve manure issues surrounding nutrient loading, salt, groundwater, quantity.
- AD can help with the consolidation of manure so that it can be treated in the most effective and cost efficient manner.
- There needs to be a comprehensive post digester, residuals handling strategy in order to preserve the integrity of any digester project.
- If anaerobic digestion is considered for nutrient reduction, importing of any gas production potential has to work in lockstep with exporting of residuals.

Thank You!

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