

ANAEROBIC DIGESTION PATHOGEN REMOVAL FROM MANURE

PATHOGEN REDUCTION (cont.)

Charts 3 and 4 show the variation in the levels of organisms for Farm 1 over time. The raw fecal coliform had a standard deviation of 5,000,000 CFU/gram. The raw manure for *Map* had a standard deviation of 36,500CFU/gram. Both farms exhibited a wide range of values. This variation can be attributed to variation in actual organisms shedding, sampling, and testing methods. There was not a significant difference between results between taking four samples over a 4-hour period and the composite sample. Apparently a composite of four samples varies as much as one grab sample in this study for both fecal coliform and *Map*.

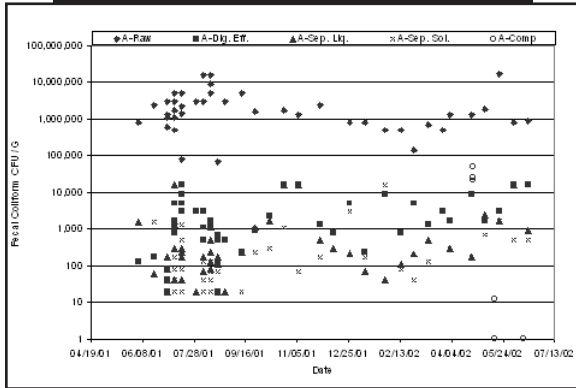


Chart 4. Fecal coliform versus time at Farm 1.

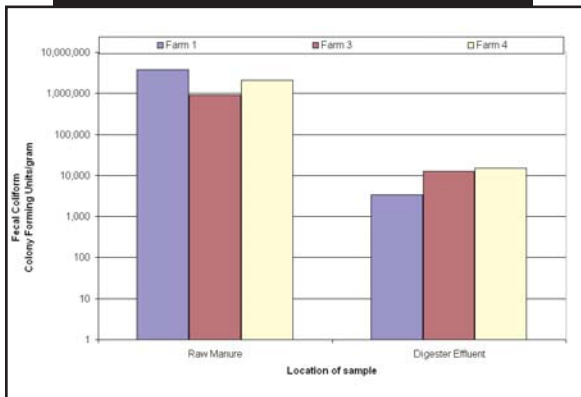


Chart 5. Potential pathogen reduction in three anaerobic digesters.

Two other digesters were also studied on a more limited basis. Farm 4 is a fixed film anaerobic digester with a retention time of 4 days. Farm 3 is a plug flow digester with a 20-day retention time. Although very few samples were taken on these farms, the fecal coliform reduction in each compares with the reduction in Farm 1 as shown in Chart 5.

Anaerobic digestion has the potential to significantly reduce the number of potential pathogens in the effluent. Composting can further reduce or eliminate pathogens. This is an important consideration when manure is applied to growing crops or used as bedding. For farms where reducing the potential for pathogen contamination of manure is a high priority, anaerobic digestion should be one of the techniques considered.

Additional ways to reduce the number of surviving pathogens even more include:

- Aeration to provide auto heating and an adverse environment,
- Anaerobic digestion at thermophilic temperatures
- Pasteurization of the manure, utilizing waste heat from the electric generation process.

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“Pathogen reduction is an important advantage of anaerobic digestion, and reduces the risks of land application.”

– Pete Wright
PRO-DAIRY

