



Cow-a-bunga! Mor-Dale Farms Turns Waste into Profit

The dairy farmer knows his operation produces two things: milk and manure. While there's a genuine market for milk, manure has a tougher reputation to overcome. Still, farmers know waste can be reused, and for centuries converting manure to fertilizer was a manual, time-consuming process with a questionable return on all that invested energy.

Ralph Moyer knows there's a better way. He owns and operates Mor-Dale Farms in Myerstown, PA and gets the most from his dairy herd because he's running a Slurrystore® Methane Digester.

This story is about a wonderful convergence of events and people where everyone wins. It started when the Chesapeake Bay Foundation awarded a grant to 43 farmers in 11 Pennsylvania counties – including Ralph – to help clean up the wastewater flowing into the Bay and its tributaries.

About that time, Ralph was building a new dairy facility that would leverage the latest technology, and he used his grant to revolutionize the way he processes waste from his dairy operation. He turned to CST Storage, Penn Jersey and Dr. Stan Weeks to tackle the challenge.

Dr. Weeks, a noted agricultural expert, designed a digester that would convert waste from cows to fertilizer and energy with reduced runoff and odor. He delivered his specs to CST Storage and Penn Jersey, who manufactured and installed the system.

Anaerobic digestion has been a recognized process for decades, but the benefits have come with a price. For example, cylindrical tanks are prone to buildup of undigested material at the bottom, which has to be cleaned out frequently. The conical bottom of the Slurrystore® Methane Digester lets gravity do its job, so there's little or no buildup and far less



tank cleaning required.

Dr. Weeks has advised the nation's top agricultural and academic programs, and over the years observed that concrete tanks are prone to leaking. So he worked with CST and Penn Jersey to produce a tank made of glass fused to steel, which is air and gas tight and provides a state-of-the-art coating that withstands the aggressive environment of an anaerobic digester.

In the pre-digester days, Ralph stored manure and spread it as fertilizer every few months as needed. For bedding, he purchased sawdust which had to be trucked in. Today, his digester converts manure from nearly 500 head of cattle into bedding and fertilizer for his fields and only requires about 5-10 minutes of his attention each day.

In fact, Dr. Weeks monitors the system's performance and can make adjustments on his computer from 300 miles away. In this era of smart machines, the Slurrystore® Methane Digester

is truly a technological marvel.

So, the system produces fertilizer and bedding more efficiently, requires minimal labor and diagnostics can be performed remotely. What else can it do?

Well, how about supplying electricity to the entire farm plus up to 50 additional homes? The gas from the digestion process is extracted from the top of the digester tank and is fed into a line, where a booster fan increases pressure and feeds it into an engine that produces electricity. Ralph's operation takes what it needs and the excess is routed to the grid, then Ralph receives a credit from the utility company.

In fact, the Slurrystore® Methane Digester has accelerated the economics of Mor-Dale Farm by becoming a profit center in its own right. In addition to waste from his herd, Ralph also handles waste processing for a nearby poultry plant. That organic waste further boosts the digester's energy production capacity and Ralph receives a tipping fee and hauling services as compensation from the plant. What's more, he uses some of the liquid for fertilizer.

Heat reclaimed from the engine not only keeps the material in the tank warm, but it also heats all the water and rooms throughout the dairy facility.

"The big benefit for us is time savings and it's really changed the type of work we do," says Ralph. "Now I spend more time monitoring and repairing machines and less time physically moving material."

The Slurrystore® Methane Digester is a workhorse. Ralph's system has been online four years and during that time has been in operation 98 percent of the time (nearly 30,000 hours) and has produced 2,301,642 kWh of electricity. "We recycle and reuse as much as we can to ensure nothing is wasted," says Ralph. "By reusing, we're maximizing the natural resources we're blessed with."

Secure Agricultural Nutrient Management

A Slurrystore is designed to meet individual owner needs. Each system has flexibility to address specific situations that any farm might incur. These include:

- **Expandability** - A Slurrystore can grow with you to accommodate increases in future ag nutrient volume or new regulations.
- **Cover Options** - A roof or cover can be incorporated into a Slurrystore System's design if needed.
- **Smaller Footprint** - A smaller footprint and the ability to build vertically minimize the effect of rainfall accumulation compared to the surface area of a lagoon. That means lower volume to haul and minimized dilution of nutrients.
- **Relocation** - A Slurrystore can be dismantled and moved or sold.
- **Digester Applications** - A Slurrystore may be used in anaerobic digester applications. CST Storage has been designing and manufacturing digester tanks and covers for over 30 years with applications around the world. CST works with process engineers to construct low maintenance structures that provide longevity and return on investment.

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