
DVO
Anaerobic
Systems

DVO, Inc.

- Formerly GHD, Inc.
- Based in Chilton, Wisconsin
- Our 1st digester (patented design) in 2001
- DVO is the USA market leader, with 88 digesters at 66 sites in these U.S. states:
  - FL, GA, IA, ID, IL, IN, MA, MI, MN, NY, OH, VA, VT, WA, WI
- 25 digesters are under construction at 19 sites:
  - FL, IA, IL, KY, NC, NY, OR, VT, WA, WI
- Currently under construction at first international projects:
  - Canada, Chile, Serbia and South Korea

Mixed Waste Examples

- **Organic Wastes Added to Our System In Addition to Manure:**
  - Restaurant/Casino/Institution Kitchen Grease & Wastes
  - Spent Supermarket Produce
  - Cheese Whey and Milk
  - Distillers Grain
  - Cannery Waste (Vegetable and Fruit)
  - Waste from a Ravioli Sauce Plant
  - Silage Spoilage
  - Slaughterhouse Waste
  - Many, many more

Power by Biogas Gensets

- **Renewable ("Green") Energy Production**
  - Four Cows = 1 kW continuously (without substrate)
  - Reliable: **GENSET** run-time average 92-98%
  - Low Parasitic Load: Average <10%

- **Greenhouse Gas Emission Reduction**
  - CH_4 (methane) is a 21 times more powerful greenhouse gas than CO_2. DVO digesters contain and consume the methane, *dramatically reducing greenhouse gas emissions from farm wastes.*

Examples of typical power generation installations at DVO sites…

Odor Control

- **97% Volatile Fatty Acid (VFA) Destruction per EPA – AgSTAR study**
  - All the waste is collected and completely contained, then the odor is "burned" in the biogas engines.
  - The digested liquid can be land applied without complaint.
  - Facilities can be located closer to populated areas (for shorter waste transport distances).
  - To obtain a farm permit, some communities are now requiring a DVO digester for odor and pathogen control.

Pathogen Destruction

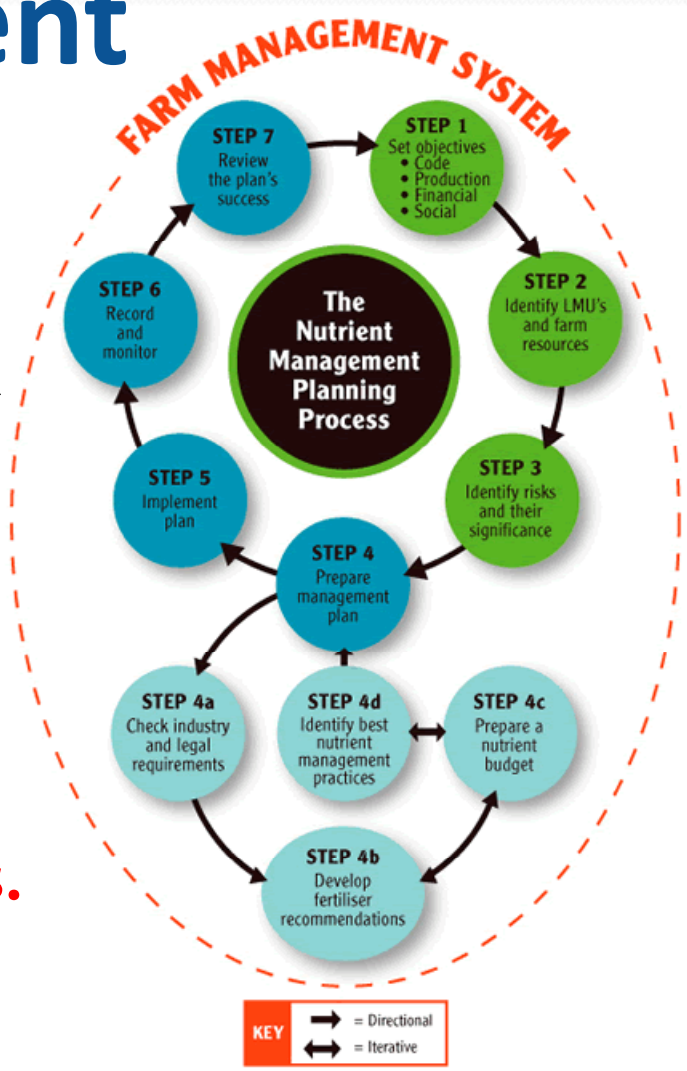
- **Environmental Benefits**
  - Pathogens such as e-coli and salmonella are reduced in the digested waste – often *to the point of undetectability*.
  - BOD and COD levels greatly reduced

Digestate Land Application

- **Liquid Fertilizer**
  - N, P and K are not destroyed by the digester. Instead, they are transformed to an inorganic state that is "plant-available". Liquid nutrients can be land-applied to a growing crop.
  - By restoring these valuable nutrients to the land, less artificial fertilizers need to be employed.
  - DVO owners report increased crop yield using digested liquid fertilizer.
  - Lessened likelihood of runoff
  - Liquid can be pivot-irrigated

Nutrient Management

- **A Continuous Plan**
  - Reduced nitrogen & phosphorus loading by separating liquids from solids
  - Lower nutrient levels allows increase in application volume per acre
- **Helps farmers prepare for tighter government regulations.**



Separated Solids

- **Valuable & Versatile**
  - High-quality cow bedding
    - Pathogen reduction
    - Somatic cell count/herd health
    - Clean cows
  - Fertilizer
    - Peat moss replacement
    - Additional revenue stream
  - Particle board

Additional Economic Benefits

- **Steady Digester Revenue Helps Dairy Farmers Weather Volatility In Dairy Industry**
  - "Next" generation more willing to enter industry
- **Rural Economic Development!**
  - Rural construction projects/jobs
    - Concrete
    - Electrical
    - Engineers, etc.
  - Potential third party investors

Questions?

DVO | ANAEROBIC DIGESTERS