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# VANDER HAAK DAIRY – LYNDEN, WA

DAIRY FARM IN WASHINGTON – FIRST OF ITS KIND IN WASHINGTON STATE

## SYSTEM DESIGN

Vander Haak Dairy was the first dairy in Washington state to install an anaerobic digester. The dairy utilizes on-farm waste and manure from two neighboring operations to feed the digester.

Manure is scraped into a receiving pit and then pumped into a two-stage mixed plug flow™ digester. During the first stage, waste is mixed and heated to 100°F using recovered heat from the engine-generator set. Residue from the first stage of the digestion system flows by gravity into the second stage where manure is transported through a semi-solid “plug” as new influent is added to the digester. After approximately 20 days, the remaining materials flow into an effluent pit.

Biogas generated from the digester is burned in a reciprocating engine set. Thirty to sixty percent of heat from the engine is used to heat the digesters and the rest is used to dry bedding fiber and heat a house. Excess heat is available to meet additional needs of the dairy.

## PROJECT BENEFITS

Vander Haak Dairy's digester project includes the following benefits:

- Odor reduction
- Electricity production
- Energy and cost savings (e.g., bedding and fertilizer reduced heating cost)
- Estimated annual return of ~8 percent (average years 1-10); ~22 percent (average years 11+)

Digester effluent is separated into solid and liquid streams. Solids are used for on-farm bedding and the rest is sold to neighboring dairies or aftermarkets (e.g., composters) for soil amendment. Liquid effluent is stored in a lagoon where it can be easily pumped to fertilize the land.



Photo: Washington State University

*“If dairy farming on the West Coast is to survive, we need to move ahead with projects like this.”*

—Darryl Vander Haak  
Owner, Vander Haak Dairy

- **Population Feeding Digester:** 750 (system designed to support up to 1,500)
- **Baseline System:** Storage Tank or Pond or Pit
- **Digester Type:** Two-Stage Mixed Plug Flow™
- **Co-Digestion:** Egg breakage, fish solids, food breeding, sauce, other feedstock's. (18.4 % substrates, mainly from fish processing plant)
- **System Designer:** DVO, Inc. (Design); Andgar, Corp. (General Contractor)
- **Biogas Use:** Electricity
- **Generating Capacity:** 600 kW
- **Receiving Utility:** Puget Sound Energy
- **Project Funding:** USDA