

**PennState**

Anaerobic digester will enhance nutrient management at Penn State farms



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UNIVERSITY PARK, Pa. — An anaerobic digester being constructed as part of the Department of Animal Science's renovation project at its farms is a part of its total nutrient management program that will also support Penn State's sustainability goals.

Designed to handle manure from livestock on several of the University-owned farms, the digester will improve efficiency, reduce odor, decrease greenhouse gas emissions and allow more land acres to be used for manure application.

"The new digester will allow us to continue our commitment to being responsible stewards, maximizing the value of nutrients from our livestock population," said Terry Etherton, head of the Department of Animal Science. He noted that an added advantage will be increased educational and outreach opportunities.

Challenges for the farms include the proximity of animals and fields to the University Park campus and the University Park Airport, as well as transporting manure to fields.

The digester will also aid Penn State in its sustainability goals. During the fermentation process in the digester, methane is produced and separated, leaving a semi-odorless product that retains nutrients and can be field-applied on University farmlands.

The digester volume is 400,000 gallons with an operating volume of 360,000 gallons. Inflow will receive an average of 11,500 gallons of manure/washwater per day when it becomes operational in the Fall of 2019.

With a potential of 9,000,000 BTUs and 830,000 kWhs, the greenhouse gas reductions for the University would exceed 500 metric tons of CO₂ equivalent, contributing to Penn State's goal of 35-percent greenhouse-gas reduction by 2020, as noted by University President Eric Barron to the Board of Trustees at the May 2018 meeting.

The project, which is expected to be completed by Fall 2019, is part of the University's Energy Savings Program and received a low-interest loan of \$600,000 to cover some of the costs. In addition, the Office of Physical Plant (OPP) applied for a grant through the West Penn Power Sustainable Energy Fund (WPPSEF) Sustainable Energy Financing Program and received an additional \$75,000 under the category of "Clean Heat and Power

Technologies." The remainder of the project will be funded through the College of Agriculture, major maintenance funds as identified from the Capital Plan, and the Facilities Resource Committee.

"The Office of Physical Plant is excited to assist the Department of Animal Science with securing funding to support Penn State's overall GHG reduction goals," said Laura Miller, Energy Program manager. "This project will lower the carbon footprint of the animal operations while providing a facility to increase education and outreach to farmers across the Commonwealth."

With every application of technology like the anaerobic digester, Penn State researchers disseminate valuable information, allowing community members and West Penn Power customers to be better informed in making energy choices. Those energy choices contribute to the success of environmental sustainability, one of the goals of the Alternative Energy Portfolio Standard (AEPS), and subsequently West Penn Power and its ratepayers.

While the most direct and measurable benefit to the West Penn Power ratepayer may be greenhouse gas mitigation, the indirect benefits can also be considered. This project aligns with the WPPSEF mission to benefit ratepayers by promoting renewable technologies; practicing energy conservation; and providing educational benefits.

Because the Department of Animal Science is part of an extensive Cooperative Extension network, the awareness and educational benefits of the digester will be disseminated throughout Pennsylvania and the Northeastern United State.

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