

Hog manure - energy, no longer a dark subject

COLUMBIA, Mo. — Energy — natural gas and electricity — from hog manure!

It's an idea that has taken a lot of kidding.

Today, it's on the brink of being economically feasible for supplying 80 to 90 percent of a hog farm's thermal and electrical energy needs.

Scientists at the University of Missouri-Columbia built the first successful, completely automated manure digester incorporated into a hog farm in the fall of 1976.

That digester converts

manure into methane or natural gas and subsequent electricity. It was designed to test the practicality of such digesters on American farms.

"It works — no question about that!" exclaimed James Fischer, UMC agricultural engineer. "It could produce 6000 cubic feet of methane a day, enough to provide 100 percent of the electricity and 90 percent of the thermal energy for the UMC swine farm operation."

"And with the cost of electricity and propane

going up, the economics of these digesters is looking better every minute."

Donald Osburn, UMC agricultural economist, figured that a farmer with a facility that markets 3200 hogs per year (a 250-sow herd) could afford to spend \$62,375 for a digester and an engine-generator and still break even — if electricity from outside sources was going at 8 cents per kilowatt hour and propane at \$1.10 a gallon.

It cost \$29,000 to build the Missouri digester, which is large enough to process 9,000

cubic feet per day — the manure from a 225-sow herd (2800 hogs marketed per year).

But that digester was largely an experimental model. A farmer could probably build one for less.

Fischer and Osburn say that a methane digester system, in order to be profitable, must serve as a water heater and an electric generator. This is called "co-generation" — using the heat from the same machine that produces electricity.

Also, in order for a system

like this to be effective, a farmer must have an energy efficient operation; well-insulated, environmentally controlled farrowing unit and nursery, plus open front finishing and gestation.

"If I were going to build a new hog confinement system today, I'd design it with a manure digester in mind," says Fischer.

"I might not put in the digester today, but I'd have room for it if costs of electricity and propane continue to rise."

Manure digestion, explained simply, is a matter of methane bacteria converting manure into natural gas.

Basically, one group of bacteria converts the manure into volatile acids; another group breaks them into carbon dioxide and hydrogen; and a third group converts the carbon dioxide and hydrogen into methane.

"As I see the methane digester of the future," he said, "I expect it will be converting a lot of biomass besides manure into energy."

Experts expect such biomass digesters to account for only 3 to 5 percent of our energy needs for the future. But in certain places, like farms where the stuff is available, that figure could well be over 90 percent.

Love honored for teacher education

STATE COLLEGE — Gene M. Love, head of the Department of Agricultural Education at the Penn State, has received the Distinguished Service Award of the American Association of Teacher Educators in Agriculture.

The award is the highest recognition given in the U.S. for leadership in teacher education in agriculture. Love received \$500 and a certificate. The occasion was the annual meeting of the association in Anaheim, Calif.

Love has been head of the Department of Agricultural Education at Penn State since 1975. In this capacity he is also Director of Vocational Teacher Education at Penn State. He has been instrumental in organizing a comprehensive development

center for vocational teacher education.

Before coming to Penn State in 1975, Love was coordinator of agricultural education at the University of Missouri for nine years. Prior to this he was a member of the agricultural education faculty at Penn State. He served on the faculty of Stanford University while on assignment in the Philippines.

Following his graduation from Penn State in 1949, he taught agriculture at East Donegal High School, Maytown, until 1951. From 1951 until 1954, he was a graduate fellow in agricultural education at Penn State. He taught briefly at West Chester High School before entering the Air Force in 1954. He received his master of science degree in 1953 and

the doctor of philosophy degree in 1954, both from Penn State.

In 1971, he received the Education Research Award of the American Institute of Cooperation. He has written numerous articles and papers and has developed many teaching manuals. He is past president of the American Association of

Teacher Educators in Agriculture and current president of Phi Delta Kappa at Penn State.

Other professional membership include: Alpha Tau Alpha, Gamma Sigma Delta, American Vocational Association, and the National Vocational Agriculture Teachers' Association.



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