


Poultry Science Capital Region Veterinary Science

Penn State

Poultry Pointers



Entomology Food Science

Agricultural & Biological Engineering Agricultural Economics

SMELL OR ENERGY FROM CHICKENS?

Robert E. Graves, Professor Of Ag Engineering

Poultry manure is full of smell and energy. Under uncontrolled conditions, poultry manure will break down, releasing odor, ammonia gas, and a little heat.

Under controlled, anaerobic conditions, there will be little odor and the break down of poultry manure can produce energy in the form of biogas. The residue from anaerobic digestion and biogas production is a stable, low smelling liquid that still contains the fertilizer value of the original manure.

Biogas is the burnable mixture of methane, carbon dioxide, and other trace gases that results from anaerobic digestion of organic material. It is similar to natural gas but with only 60-80 percent of the heat content.

A biogas production unit, or "digester," is a large, heated closed tank or container that excludes air.

Liquid manure is held in the tank for 20 to 25 days at temperatures of 95 to 105 degrees F. These conditions promote the growth of two types of microorganisms. One group, called acid formers, break down manure into simple organic acids. This is called the liquefaction phase. These acids are then converted to biogas by methane forming bacteria during the gasification phase.

Proper temperatures, pH, and organic loading rate are necessary for growth of the methane formers. If these bugs are not working, there will be little methane gas production and the result will be a sour, smelly, nonfunctioning digester.

A biogas digester can be compared to a living animal; in fact, the rumen of a cow is a large digestion or fermentation unit. Just like a cow, a digester needs to be fed and cared for in a consistent manner for best results. Failure to do this will result in a "sick," malfunctioning digester.

Recently there has been a renewed interest in biogas production as a method to help control odor when large quantities of manure must be handled and stored as

part of nutrient management planning. Pennsylvania has digesters operating on large dairy, swine, and poultry farms. The gas from these units is used to fuel engine-powered generators that produce electricity and engine heat. Engine heat is used to maintain the desired digester temperature. Extra engine heat may also be used to provide hot water for space heating or direct use.

On a recent trip to China, sponsored in part by the Center for Rural Pennsylvania, Penn State and USDA, a group of agriculturalists witnessed the use of very small scale "mini-digesters" to provide biogas for cooking and lighting in rural homes. With our cheap and easily available energy, these small-scale systems are of little interest to Pennsylvania farmers. However, the possibility of controlling odor and obtaining usable energy has rekindled interest in medium- and large-scale digesters.

Animal manures can make very good feedstocks for biogas digesters. Manure needs to be in a pumpable form with a moisture content near 90 percent. Cage layer facilities can be managed to produce manure of this moisture content.

Disruption of digester operation because of floating materials such as straw, sawdust, and feathers or settling of heavy materials is often a problem. Further, manure from cage layers provides another unique problem. Limestone or grit in poultry manure will rapidly settle out as the manure is heated. This can quickly build up in the bottom of the digester, interfering with heating and general digester operation. The successful poultry manure digester in Pennsylvania utilizes a preheat settling chamber

to remove this material before the digester.

A few forward-looking, innovative farmers have proven that biogas digesters can function on Pennsylvania farms. These pioneers have contributed much to our knowledge and understanding of biogas production and utilization. Digester design, construction, and operation is still an individual, specialized process that is more easily implemented on larger farms.

Systems for larger number of animals have a lower unit cost. Larger farms are more likely to have the resources required to

develop needed skills in design, construction, and operation.

As more people become involved with digesters, new ideas and technology are bound to improve on today's methods. Solids separation and use of fixed film digesters to shorten digestion time making smaller digesters more efficient are just two of the ideas currently being considered.

Perhaps with more interest and experience, the pioneering work and investment of these leaders will become a realistic alternative for many more Pennsylvania farmers.

AFT Hails Publication Of Regulations

WASHINGTON, D.C. — American Farmland Trust (AFT) applauded the publication of the final rules for the Farmland Protection Policy Act, a measure adopted 13 years ago to compel federal agencies to spend tax dollars more efficiently and minimize the taking of farmland for highway construction and other federal projects.

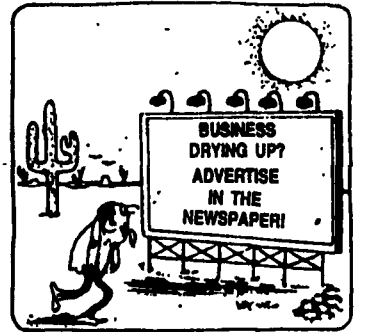
The rules will govern how the act is actually carried out throughout the U.S.

AFT, a national farmland conservation group based in Washington, has long pressed for the issuance of the rules with the USDA and other agencies.

"Secretary Espy and the USDA deserve credit for taking the critical step necessary to implement the Farmland Protection Policy Act," said AFT President Ralph Grossi, a third-generation farmer.

"It is a signal that, finally, the administration will carry out the will of Congress and become a partner in the effort by states, local communities, and private organizations to protect our nation's strategic agricultural land."

The U.S. is losing a considerable amount of its best and most productive farmland to permanent non-farm development. Much of the loss is occurring on the urban edge of metropolitan America. In the six-county Chicago area, for example, 450 square miles, or 288,000 acres, of farmland were permanently converted to other uses between 1970 and 1990. By the year 2010, the Northeastern Illinois Planning Commission estimates another 220 square miles of farmland may be lost, a land mass equal in size to the city of Chicago today.



NEED YOUR FARM BUILDINGS PAINTED?

Let us give you a price! Write:

Daniel's Painting
637-A Georgetown Rd.
Ronks, PA 17572

(or leave message)

(717) 687-8262

Spray on and Brush in Painting

HERNIA?

No hernia is unrepairable, even after several previous failed attempts. We specialize in outpatient hernia repairs, and most patients are able to return to full work within several days.

PLEASE CALL COLLECT OR WRITE FOR MORE INFORMATION
MID ATLANTIC SURGICAL SERVICES

217 Harrisburg Ave., Suite 201
Lancaster, PA 17603

(717) 295-5454
MOST INSURANCE ACCEPTED

These tractors make good sense.

Belarus
Sensible Down To Earth Tractors



For a tractor that offers real value, check out our 70-hp Belarus 572. It's dependable and fuel efficient, with a high-torque diesel engine that provides optimum pulling power. On-the-go 4-wheel drive gives you extra traction when you need it. And the heated cab keeps you comfortable. All at a low price that makes the 572 an outstanding value. Stop in and see us for all your farm equipment needs and take a look at the Belarus 572.

PENNSYLVANIA

LARRY WILHELM
Route 1, Box 38A
Reynoldsville, PA

MARSHALL MACHINERY, INC.
Route 652, RR 4
Honesdale, PA

ROVENDALE AG & BARN EQUIPMENT
RD 2, Box 210
Watsonstown, PA

LUBINIECKI WELDING & EQUIPMENT
RD 2, Box 160
Meadville, PA

ANDERSON TRACTOR SALES
636 B S. Main St.
Shrewsbury, PA

MARYLAND

STARKEY FARM CO.
Rt. 213, PO Box 250
Galena, Md.

SCHROCK FARM EQUIPMENT
Route 1, Box 2568
Oakland, MD
301-334-9060

ANDERSON TRACTOR SALES
4600 Breidenbaugh Lane
(Off 12200 Manor Rd.)
Glenarm, Md.
410-592-7422

WEST VIRGINIA

BEVERAGE TRACTOR
Rt. 522 S.
Stuarts Draft, VA
800-296-3325

NEW YORK

NEL'S LUG-A-LOT COMPANY
4793 Watkins Road,
Millport, NY

BROWN'S TRACTOR & EQUIPMENT SERVICE, INC.
RR 2, Box 11B,
Jackson Hill Rd.
Bonnville, NY

