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Nothing going to waste, not even waste

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As Ohio joins the national rush to make corn-fed automotive fuel, there are lingering questions about the net energy gain - or loss.

In other words, does it take more energy to make ethanol from corn than the biofuel gives back?

Early studies concluded the process lost energy, but as the technology and size of the distilleries have grown, most experts now think there is a net gain.

Estimates are that corn-based ethanol gives back between 1.2 and 1.67 units of energy for every unit of fossil-fuel-based energy used to plant, fertilize, harvest, transport, ferment and distill the crop into alcohol.

Actually, the energy math depends in part on what happens to all of the byproducts.

One ethanol plant now being built in Ohio - Harrison Ethanol LLC in Cadiz - aims to alter the energy calculus with a creative, if costly, circular technology.

The Harrison facility will include barns that can hold as many as 12,000 head of beef and dairy cattle. The animals will eat the tons of corn mush, known as dried distillers grain, left over from the ethanol production.

Typically, ethanol refineries have to ship this material either to distant feedlots or to other plants for commercial sale. By housing the cattle on site, Harrison Ethanol eliminates those costs.
Fattening cattle also creates unsavory byproducts - manure and urine - and in this case, a lot of them.

That's where an "anaerobic digester" comes in. Harrison Ethanol has obtained state permits to build and operate a large digester - a biochemical operation that can convert animal wastes into useful products. Harrison even has a $500,000 U.S. Department of Agriculture grant for the work.

The digester will handle about 50 million gallons of manure a year. That's about 60 flushes of the stables a day, according to state records, a bonanza for the digester's microorganisms that will generate thousands of cubic feet of combustible gas - methane and carbon dioxide.
The CO_2 will be captured for commercial sale. The methane will fuel a boiler and a small power plant to run the fermentation and distillation equipment, and maybe even have some power left over.

The plan is for the feedlot and digester to gradually begin operations next spring, with ethanol production ramping up in the fourth quarter.

Wendel Dreve, director of Harrison Ethanol, has described the project as a "vertically integrated, agriculturally based industrial development."

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