

# Saving the Environment

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Kenn Buelow of Holsum Dairies LLC shows the methane digester-reclaimed manure solids he uses as bedding.

The 6,800 cows at Holsum Dairies LLC are energy misers. Each cow uses 40% less electricity for lights, ventilation, milking, cooling and everything else that sustains her and brings her milk to market.

"Looked at individually on a kilowatt hour [kwh] per cow basis, we're using 600 kwh per cow per year versus the national average of 1,000 kwh," says Kenn Buelow, a partner in the Hilbert, Wis., operation.

And that translates into very real dollar savings:

- ▶ \$30,000 from more efficient barn fans.
- ▶ \$25,000 from plate coolers and heat recovery systems for milk cooling.
- ▶ \$25,000 from more efficient lighting.
- ▶ \$18,000 from using variable-speed pumps on milk pumps and water wells.
- ▶ \$20,000 in waste heat recovery from milk cooling and methane generation that is re-used for in-floor heating of the milking parlor, holding pen and calf nursery.

Simply "right-sizing" payloaders and other engined farm equipment saves another \$22,000 annually. "At our size of operation, some of this equipment is running all day long. If you can save 1 gal. of fuel per hour by appropriately sizing a payloader, for example, that adds up to big savings over the course of a year," Buelow says.

**Holsum Dairies LLC** is one of four dairies recognized nationally in the first-ever U.S. Dairy Sustainability Awards presented by the Innovation Center for U.S. Dairy. In addition, Holsum Dairies won one of three Elanco Awards for Outstanding Dairy Farm Sustainability. (See sidebar on page 8 for the other winners.) It's easy to see why.

Holsum Dairies milks its 6,800 cows on two locations in northeast Wisconsin. Each facility has a

methane digester to process manure into electricity and re-usable solids for bedding. The bedding is used on the farm, with surplus sold to neighboring operations.

Electricity produced by the digesters is sold into the national power grid. Electricity used on the dairy is then bought back from a local utility.

"We have net metering in Wisconsin, but the technology is still too expensive for us to implement. So we simply sell the electricity we produce and buy back what we need," Buelow says. "We're still making money with the digesters."

One of the reasons is that here, too, right-sizing and fine-tuning equipment allows for optimal power production. "The key is finding the right people to work and control the digester operation," Buelow says.

Holsum Dairies also has 14 months of lagoon storage. That means it can take in other food wastes (often by the semi-load) to increase the digesters' efficiency and collect tipping fees for doing so. Some of the other digester substrates taken include breaded vegetable wastes, malt ingredients, food waste from local school cafeterias, cheese trappings and even rumen paunch material from a local slaughter plant.

**The excess lagoon capacity** allows Holsum's field crew to spread the liquid effluent at a time of its choosing. That's important because Holsum works with 40 area farmers who supply the dairies with alfalfa and corn silage and receive manure fertilizer.

Altogether, Holsum works with area farmers to maintain a nutrient management plan on 11,000 acres. On a commercial fertilizer equivalent, it provides \$1 million per year in organic fertilizer to these fields.

The liquid effluent supplies fertilizer for 3,000 to 4,000 acres per year. On alfalfa fields close to the dairies, it can supply 100% of fertilizer need. "On corn ground, we try not to supply 100% of crop need, simply because the agronomists want some commercial nitrogen in spring as a starter to get the crop growing," Buelow says.

All the effluent is pumped via pipeline and drag hose from one of the dairies, and 70% to 80% of effluent from the second. Some manure is pumped up to three miles.

"This minimizes truck use, fuel use and road traffic," Buelow says. And that's key, since some Wisconsin counties are strictly enforcing road weight limits. Those limits can cut the volume of manure being hauled by half and double truck trips and time.

## **And the Winners Are...**

The four winning farms of the U.S. Dairy Sustainability Awards all have impressive environmental, energy and sustainability records.

### ***Elanco Award for Outstanding Dairy Farm Sustainability***

Blue Spruce Farm, Bridport, Vt., has reduced its milking-time electricity needs by 60% through the use of a variable-speed vacuum pump control, and has cut its other electricity needs in half by implementing new technologies in lighting, milk cooling, ventilation and water heating. Holsum Dairies LLC, Hilbert, Wis., has 11,000 acres under a single nutrient management plan. That allows Holsum to target manure applications to specific fields to reduce overapplication and commercial fertilizer use.

Werkhoven Dairy, Inc., Monroe, Wash., uses a methane digester to produce electricity for the equivalent of 300 neighboring homes while producing Grade A compost as a natural fertilizer for its fields and those of its neighbors.

### ***Center for Advanced Energy Studies/Idaho National Laboratory Award for Outstanding Achievement in Energy***

Brubaker Farms, Mount Joy, Pa., uses a digester and 10,000 sq. ft. of solar panels on its heifer barn to produce electricity for both the farm and 200 neighboring homes.

### **Cost Savings Real**

The Innovation Center for U.S. Dairy, through a program called EnSave, is spearheading an effort to reduce energy use and greenhouse gas emissions while improving farm profitability.

Energy audits on 137 dairy farms in 2009, 2010 and 2011 show that all three goals are possible. "Most of the energy-efficient equipment has less than a five-year payback average, and that's without incentives," says Robert Madeja, an Innovation Center business analyst. Add in the incentives, some of which are 75% of the cost of equipment, and equipment can be paid back in as little as two years.

Savings per farm per year range from \$2,000 to \$18,000, depending on farm size, energy use and power costs. "Typically, we see savings of 2¢ to 18¢ per cwt. of milk," Madeja says. "While that might not seem like a lot, it can be significant in years of tight margins."

And some efforts take little to no investment, he says. For example, low-temperature detergent might cost a little more, but the savings in reduced water heating can make up for it. In addition, simple, routine cleaning of ventilation fan blades and maintaining belt tension can increase fan efficiency by 10% or more.

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